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**ANNUAL REPORT
NINTH EDITION:
MONTANA'S
WATER**

DECEMBER 31, 1985

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This is the ninth edition of the Montana Environmental Quality Council's annual report. This edition focuses on the topic of Montana's water, building on the important work of the Select Committee on Water Marketing, which was staffed by the EQC.

Few would deny the importance of water to Montana's future. But we've had limited success at the state level in setting a comprehensive water policy and a workable state water plan. While the concern over the resource is obvious, the complexity of the questions surrounding water and the substantial gaps in our existing information may delay our search for the answers. But unless we find them, we run the risk of letting others determine our water future.

Our publication doesn't propose any one answer. Instead, we asked a variety of authors their opinions about the direction we're headed and how we might want to alter our path. I'm sure you'll agree with some writers and disagree with others. Our goal is merely to help stimulate the debate.

A handwritten signature in black ink, reading "Dennis Iverson", followed by a long horizontal line.

Dennis Iverson,
EQC Chairman

**MONTANA
ENVIRONMENTAL
QUALITY COUNCIL**

**ANNUAL REPORT
NINTH EDITION:
MONTANA'S
WATER**

DECEMBER 31, 1985

FOREWORD

In 1895, the Montana Legislature established the state's first formal attempt at water planning: the Arid Lands Commission. That name suggests that Montana had already recognized water as a scarce commodity.

Ninety years later, the state has changed. We have more people, more agriculture, more industry, more visitors . . . but water is still a scarce resource. And despite millions of dollars of water development, hours of debate on water conflicts, and reams of reports and water planning documents, we are, some critics charge, no closer to adopting a comprehensive, coordinated state water policy to deal with the shortage.

Such a policy would never fully solve the shortage, of course. What it would offer would be a way to improve the decisions the state must make about the shortage. In one area, conservation measures taken today might enable more water users to tap an existing supply. In another, water development might store a seasonal surplus to ease another season's deficit. A good water policy might give Montana a stronger case in federal courts against challenges from downstream users, or enough information to head off a court challenge through negotiations or compacts. And the policy could allow the state to plan for the goals it wants to achieve, instead of merely reacting to the latest water emergency.

Although water has been an important consideration in virtually every issue the EQC has investigated, the EQC decided to explore in this report the state of the state's water policy. Do we have a reasonable set of goals to solve, as much as possible, our water problems? If not, how can we develop and adopt those goals? And after we have them, how can we achieve those goals?

The 1983 Legislature assigned the EQC to staff the Select Committee on Water Marketing, which explored the advantages and disadvantages of Montana marketing its water. The committee, with support from the Lincoln Institute of Land Policy, hosted a legal and policy seminar in Billings in July, 1984. They commissioned a variety of discussion papers for the

seminar.

The EQC feels these discussion papers should be available to interested persons who could not attend the seminar, so we're including them in this report.

The papers' authors don't agree with any one viewpoint, legal argument or policy direction for the state. But they do agree on one conclusion, summarized by the Select Committee in its final report on water marketing: "... while they are important considerations, neither coal slurry nor water marketing are the only issues to be addressed. Rather, the fundamental concern . . . is the adequacy of state policies to maximize and reserve for present and future use Montana's fair share of the water. . . ."

The challenge, then, is to assess those state policies, and to improve any weaknesses. This EQC report cannot do that much; what it can do is to provide a start to the discussion.

Recognizing that the concerns over water may not be the same in Sidney as they are in Thompson Falls, we organized our report to include basinwide concerns. Our first section is an overview of the state's water resources and water policy components. The second section concentrates on the Missouri River Basin. The third covers the Columbia Basin. And the fourth summarizes special issues in Montana water policy and management.

Some of the papers, particularly those dealing with fast-changing judicial or legislative decisions, will seem out-of-date by the time this report is printed. But few of those legal and political questions — even those that seem "finally resolved" — are immune from change. And all are valuable aids in understanding the history of our water policy development. Water is involved in virtually every resource decision we make in Montana. While we can't expect to resolve all our resource conflicts with a good state water policy, it may be fair to predict that we can solve none of them without such a policy.

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ACKNOWLEDGMENTS

The EQC would like to thank all the individuals, organizations and agencies that helped prepare this document.

The Select Committee on Water Marketing, chaired by former-Senator Jean Turnage, sponsored many of the papers contained in this report. The committee included former representatives John Shontz (vice-chair) and Dan Kemmis, representatives John Harp and Dennis Iverson, former-Senator Dave Manning, and senators Chet Blaylock and Jim Shaw.

The Lincoln Institute of Land Policy continues to

encourage the discussions about water policy in Montana, and we particularly want to note the assistance of Institute staff member Will Knedlik.

The participants at the water policy seminar the Select Committee held in Billings also shared their expertise and opinions for this report.

Finally, the willing and capable efforts of two water policy experts contributed greatly to this report: John Thorson and Lauren McKinsey. To all of these people, our thanks.

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MONTANA'S WATER

MONTANA'S HYDROGEOLOGY

Water, or the absence of it, is a distinguishing feature of Montana's landscape. Straddling the Continental Divide, the state forms two distinct hydrologic regions.

In the west, the eastward flow of warm, moist Pacific air is interrupted by high mountain ranges, resulting in annual precipitation of 100 inches in some areas.

Coupled with a heavy snowpack, the high rainfall feeds numerous lakes and streams that maintain a relatively stable and abundant surface water supply. In addition, the region is blessed with abundant groundwater.

Sedimentary layers in the intermountain valleys are thousands of feet thick in some areas, forming vast underground reservoirs of high quality water.

Despite the general abundance of water, there are some valleys in the western region where precipitation is limited and seasonal water shortages occur.

Supplemental irrigation is necessary for farming in these areas and adequate water supplies are not always available.

East of the divide lie the semi-arid high plains and foothills. Climatic conditions here are more typical of inland continental regions, subject to wide variation. Although local topography may modify the climate and water availability, most of the region has very limited seasonal precipitation. Periodic water shortages and prolonged drought limit agricultural production and

population distribution.

Streams that originate on the plains may flow only during the spring runoff — a time when water is captured in numerous small impoundments to water livestock and supply some irrigation needs during the late summer.

Groundwater is critical to eastern Montana. Because of a complex geology, water-bearing formations are discontinuous and variable in their depth, yield and quality. Although less abundant and of lesser quality

than west of the divide, groundwater supplies more than 50 percent of the domestic and livestock needs in the region. In many localities, groundwater is the sole source of water for domestic and livestock needs.

This section describes the water resources of both hydrologic regions, including a brief description of present and anticipated water demands. More detailed information on Montana's water resources is available in various state and federal agency planning documents and study reports.

THE RIVER BASINS

Montana headwaters supply a significant amount of water to two of the nation's largest river systems — the Columbia River on the west and the Missouri-Mississippi on the east. Additionally, a small but important basin in Glacier National Park provides water that flows north to the Hudson Bay in Canada. The average total outflow of water from the state is approximately 44 million acre-feet per year. Table 1 provides a summary of the average annual flow in each major basin.

The average outflow values for these basins represent water resources after loss to evaporation and human consumption. The flow across Montana's borders

represents water that may have already served many important needs within the state. The instream flow requirements for hydroelectric power production, maintenance of water quality, recreation, aesthetics, and fish and wildlife habitat are all served by these flows.

Future water needs of Montana also depend on the flows that now leave the state. Agriculture, expanding population, and industrial development in the future will partly consume or deplete the quantity of water discharged from Montana's borders. These demands must be balanced against the present and future claims that downstream states place on this water resource.

Table 1. Average Annual Flows (acre-feet)

River Basin	Inflow	Originating In Montana	Leaving Montana	Percentage Originating In Montana
Columbia				
Clark Fork	703,500	15,216,500	15,920,000	95
Kootenai	7,600,000	2,520,000	10,120,000	25
Missouri				
Upper Missouri	893,600	6,431,000	7,325,000	88
Yellowstone	6,227,000	3,126,000	9,353,000	33
Little Missouri	55,930	132,000	188,000	70
Hudson Bay	0	989,150	989,150	100
Total	15,480,000	28,415,550	43,895,580	65

Source: DNRC Framework Report, 1976.

Missouri Basin

The Missouri River Basin in Montana includes all of the land area east of the Continental Divide except the small area that drains north to Hudson Bay. This area contains about 82 percent of the land area and over 70 percent of the state's population.

The rivers of this region, including the Yellowstone and the upper Missouri rivers and their tributaries, are important water resources not only for Montana but also for the entire Missouri River Basin. Montana and Wyoming together contribute 76 percent of the streamflow at Sioux City, Iowa, the division point between the upper and lower basin and the starting point for navigation in the lower river.

The area covered by the upper Missouri River Basin is the largest of the state's major basins, containing nearly 54 percent of the land but only 17 percent of the water resource. Except for water entering from Yellowstone Park and Canada, the water of the upper Missouri River originates in Montana.

A major feature of the water resource of the upper Missouri River Basin in Montana is the water stored in reservoirs. Thirty-eight reservoirs in the basin have storage capacities of 5,000 acre-feet or more. The largest of these are Fort Peck (19 million acre-feet total storage area), Canyon Ferry (2.1 million acre-feet) and Tiber (1.3 million acre-feet). The 38 reservoirs have a total storage capacity of more than 25 million acre-feet.

In addition to the large reservoirs, there are hundreds of smaller impoundments in the basin providing irrigation, flood prevention and stockwater benefits.

Yellowstone Basin

The Yellowstone River Basin, a subdivision of the Missouri River Basin, is shared about equally with Wyoming. Approximately 67 percent of its total annual flow enters Montana from tributaries originating in Wyoming. A portion of this water is allocated to Montana's use according to the provisions of the Yellowstone Compact. Much of the remaining flow comes from tributaries originating in the mountains

upstream from Billings. Tributaries in the lower basin often are depleted due to low precipitation in late summer.

Seven reservoirs in the Yellowstone River Basin have a combined total storage capacity of 1,537,000 acre-feet. These water developments plus several hundred smaller impoundments support extensive irrigation and stockwater users. The Yellowstone Reservoir, the largest in the basin, also provides for potential industrial development, flood control and power generation.

Approximately 13 million acre-feet of water are diverted in Montana to supply irrigation needs in the Missouri River Basin; nearly 3.5 million acre-feet are consumed by this activity. There have been several projections of new irrigation potential for this region. Under the Pick-Sloan Missouri River Basin Plan, Montana is authorized to divert water for developing new irrigation. Estimates of irrigable lands have been as high as 9 million acres, but the actual values depend on more detailed analysis of soil, water availability, economic feasibility and competing demands.

Water for industrial and energy development was once forecast as the highest demand in the region. Although these demands have not been realized, the potential remains for using substantial quantities of water for energy or industrial needs. Other related uses such as municipal and domestic needs are projected to increase moderately through the year 2000.

Columbia Basin

The upper Columbia River Basin in western Montana is composed of two major river systems — the Kootenai and the Clark Fork. Together these rivers and their tributaries drain approximately 17 percent of the state's land area, but that accounts for about 59 percent of the state's total outflow. The upper basin generates approximately 17.7 million acre-feet per year of water over and above consumptive uses. This volume, combined with an inflow of 8.3 million acre-feet from Canada, produces an annual outflow of 26 million acre-feet at the Montana-Idaho border.

Water storage reservoirs in the upper Columbia River Basin include 22 large reservoirs with a total storage capacity of almost 12 million acre-feet. Most of the reservoirs were created for irrigation purposes, but several, including Lake Koocanusa, Hungry Horse and Noxon Rapids, are important hydroelectric power stations.

Hydroelectric power generation, a non-consumptive use, is the dominant and controlling water use in the

upper Columbia River Basin. For example, the U.S. Army Corps of Engineers has submitted a water rights claim for 8.2 million acre-feet per year — virtually the entire flow of the Kootenai River at the Libby Dam. In addition, the hydroelectric plant at Noxon Rapids on the Clark Fork, owned and operated by Washington Water Power, has water rights for 36.2 million acre-feet per year.

Irrigation is the largest diversionary water use and the largest consumer of water in western Montana.

Although irrigation is a relatively minor use in the Kootenai Basin, it is an important and increasing water use in the Clark Fork Basin. Approximately 443,000 acres were irrigated in 1975, but this figure is expected to increase to 516,400 acres by the year 2000. Studies predict that municipal, rural domestic and industrial water uses will increase only modestly by the year 2000.

The effect of existing hydroelectric instream flow rights on municipal, industrial, and agricultural water use could be a source of major conflict in this region. Potential for conflict exists between Montana's interest in developing consumptive uses and downstream interests in hydroelectric generation.

Hudson Bay Drainage

A small drainage in Glacier National Park flows northward into the Saskatchewan River — a tributary to Hudson Bay in Canada. Although it drains less than one percent of the state's land area, the basin discharges an average of 989,000 acre-feet of water per year. Lake Sherburne in Glacier National Park forms an important storage reservoir in the system, from which an average seasonal flow of 143,000 acre-feet is diverted for irrigation in the Milk River portion of the Missouri Basin.

1980 Major River Water Use (thousand acre-feet)

	Hydroelectric Power Generation*	Thermoelectric Power Generation	Self-Supplied Industry	Public Water Supply	Rural Domes.	Irrigated Ag.	Livestock	Basin Total
Kootenai								
Withdrawn	6,728	13	15	2	1	40	0	6,799
Consumed	0	0	2	1	1	13	0	17
Clark Fork								
Withdrawn	27,611	0	33	46	5	2,006	3	29,704
Consumed	0	0	5	17	5	534	3	564
Missouri								
Withdrawn	37,265	0	3	71	7	8,627	16	45,989
Consumed	0	0	1	25	7	1,787	16	1,836
Yellowstone								
Withdrawn	2,381	94	11	38	3	4,707	9	7,243
Consumed	0	9	1	15	3	917	9	954
State Total								
Withdrawn	73,985	107	62	157	16	15,380	28	89,735
Consumed	0	9	9	58	16	3,251	28	3,371

* Hydroelectric power generation does not withdraw water, but these values are included to provide a comparison of all water uses.

Source: Montana Water Use, DNRC, 1984

WATER QUALITY IN MONTANA

Montanans' ability to put state waters to beneficial use depends directly on the degree to which those waters remain free from pollution. Good water quality is a necessity for many domestic, recreational, agricultural, and industrial uses. Degraded waters lose potential uses and often have additional adverse consequences for human health, agricultural productivity, fish and wildlife populations, and local economies.

Montana Water Quality 1984, published by the Water Quality Bureau of the Department of Health and Environmental Sciences, reviews water quality in Montana with an emphasis on current problem areas.

The 128-page report was submitted to the Environmental Protection Agency (EPA) to meet the state's biennial reporting requirement under the Federal Water Pollution Control Act.

The report ranks surface waters with serious water quality problems. It also documents a number of special water quality problems in Montana, ranging from saline seep and stream sedimentation to toxic algae blooms and hazardous wastes. Various control programs are being implemented in these instances; the report indicates both the breadth and the limitations of the tools available to combat water quality degradation.

WATER QUALITY ASSESSMENT

Montana has limited personnel and financial resources to address the large number of water pollution problems across the state. To utilize these resources most effectively, the Water Quality Bureau (WQB) assessed surface waters impacted by human activities. The assessment was used to rank those streams and lakes needing attention. The bureau also collected some information on groundwater quality to indicate problem areas.

forestry practices. The problems in these cases are mostly sediments, salts, and elevated temperatures, the last caused in part by dewatering for irrigation. Because such "nonpoint" pollution stems from a variety of sources and locations, it is often impossible to determine what fraction of the problem is due to human activities and what improvement can be attained.

The Water Quality Bureau states that each of the 70 ranked stream segments could be improved under existing regulatory authority and pollution control programs if adequate funding were available. However, limited financial resources slow the pace of water quality improvement in most cases.

Streams

The WQB identified 70 stream segments across Montana, totaling 1,165 miles, as having predominantly man-caused water quality problems that severely limit water uses. The bureau tested for 37 water quality characteristics, including nutrients, bacteria, salts, metals, temperature, pH, and suspended solids. These 70 stream segments are far below their potential for sustaining aquatic life, for use as drinking water, for recreation, and in some cases for irrigation and livestock watering.

Mineral development contributes to water quality degradation in 41 of the 70 listed stream segments, although only six of these streams are affected by currently active mines. Five of the 10 streams with the most severe water quality problems are located in southwestern Montana and have been polluted by old mining operations.

Irrigation and other agricultural practices contribute to the degradation of 36 stream segments, including four of the 10 most polluted. Municipal wastewater treatment plants are the third greatest problem source, with 22 streams exhibiting nutrient or bacterial pollution from treated wastewater effluent. Additional sources contributing to the documented pollution of at least five priority stream segments are: dams, urban runoff, grazing, and industrial discharges.

Not included in the stream ranking are thousands of stream miles that suffer less severe water quality degradation attributable to farming, grazing and

Lakes

The WQB indicates that poor water quality impairs many of Montana's most significant lakes. The major reservoirs on the Missouri River, several reservoirs along the Rocky Mountain Front, and a number of natural and artificial lakes in northwestern Montana are included on a list of the 20 most significant lakes with water quality problems. But gaps in data mean the specific causes of, and potential solutions to, lake water pollution remain largely unknown.

Both Flathead Lake and Whitefish Lake in northwestern Montana have been intensely studied in recent years. These natural water bodies are extremely important recreational and economic resources, and residents are concerned about the impacts of rapid population growth around the lakeshores and in upstream communities.

In 1983, the Flathead River Basin Environmental Impact Study concluded five years of research that demonstrated that human sources of phosphorus were dramatically increasing algae growth in Flathead Lake. Increased algae growth is a symptom of "eutrophication," the biological aging process of lakes. Although natural eutrophication takes thousands of years, the process can accelerate greatly when human activities add unnatural amounts of phosphorus or

other nutrients. The results of such “cultural eutrophication” inevitably include murky water, reduced oxygen levels, slime-covered lake bottoms, and reduced populations of desirable fish species.

Researchers found that Flathead Lake is on a threshold between retaining its nearly pristine water quality or becoming severely degraded. A major bloom of toxic blue-green algae during the summer of 1983 confirmed the strong potential for damage to Flathead Lake water quality unless immediate steps are taken to reduce phosphorus loading. The largest source of phosphorus to the lake is the sediment carried by the Flathead River. Much of this sediment derives from naturally eroding river banks, but logging and roading along the Flathead River headwaters contributes a significant, although unquantified, percentage. The research also indicated that the four major upstream sewage treatment plants represent the largest controllable source of nutrients, contributing nearly 20 percent of the lake’s phosphorus.

Based on these findings, the WQB developed a six-step strategy for limiting phosphorus in Flathead Lake: requiring phosphorus removal from the effluent of sewage treatment plants; expanding water quality monitoring; restricting use of phosphorus-containing detergents; controlling nonpoint phosphorus contributions from agriculture and forest practices; insuring septic tank drainfields are placed only in suitable soils; and drafting a management plan for non-sewer communities around the lake. The Flathead Basin Commission, established by the 1983 Montana Legislature, serves as a public “watchdog” over the efforts to maintain Flathead Lake water quality. Although lacking enforcement authority, the Flathead Basin Commission provides a community forum to focus public attention on water quality.

Like Flathead Lake, Whitefish Lake has been found to be just below the critical threshold for phosphorus loading and potential water quality degradation. Shoreline creeks contribute about 70 percent of the surface phosphorus inputs; investigations are now underway to determine the amount of phosphorus derived from human sources, especially shoreline septic systems, so that necessary control measures can be undertaken.

Wetlands

Water quality in Montana’s swamps, marshes and other wetlands is a concern because of the importance of these sites for waterfowl and other wildlife. Salinity problems related to nearby agricultural activities have

been documented at Benton Lake National Wildlife Refuge, but few other wetlands have been well studied. A more important threat to the integrity of wetlands is destruction by drainage; recent years have seen a marked decrease in funding for federal wetland protection and acquisition programs.

Groundwater

The two major environmental issues emerging in the 1980s are intimately linked — hazardous waste management and groundwater quality. Montanans have been a part of the growing national awareness of these twin concerns, primarily because five Montana sites are on the national priority list for hazardous waste cleanup under the federal Superfund program.

The five Montana Superfund sites are:

- Silver Bow Creek (arsenic and heavy metals from mine tailings);
- Anaconda smelter (arsenic and heavy metals from copper smelting);
- Milltown Reservoir (arsenic pollution of groundwater);
- Libby groundwater (wood preservatives in groundwater); and
- East Helena smelter (airborne lead pollution of surrounding land).

The three other Montana sites proposed for inclusion on the national priority list are wood preservative operations at Somers and in Bozeman and a chromium processing plant near Columbus.

Additionally, state officials have identified more than 80 sites where toxic material spills or hazardous wastes pose a potential threat to human health and groundwater supplies. The major sources of the pollutants include oil refinery sludges, wood preservatives, pesticides, and heavy metals from abandoned mines. DHES officials are conducting preliminary investigations at a number of these sites.

Sixteen solid waste landfills in Montana are believed to threaten groundwater quality through the leaching of contaminants. Most of these sites existed before the current licensing process which is intended to prevent landfills from being located above shallow aquifers.

Contamination of groundwater by gasoline from leaking underground storage tanks is recognized as one of the leading water quality problems on both national and state levels. At least 47 such cases have been reported in Montana since 1982, including an incident in Miles City where hundreds of thousands of gallons of diesel fuel have contaminated the shallow aquifer underlying a railroad yard. Cleaning up groundwater is

extremely expensive and is generally only about 70 percent effective. Recently enacted amendments to the federal hazardous waste law (the Resource Conservation and Recovery Act) will provide EPA and authorized states with the authority and responsibility for regulating underground storage tanks. The legislation emphasizes prevention and early leak detection.

Special Problems

Nonpoint pollution derives from the range of human activities along a stream course, including agriculture, forestry, mining, and urban development. Sediments, salts, and metals are the major nonpoint pollutants that enter Montana waterways. Although the release of nonpoint pollutants from a single parcel of land may appear minor, the cumulative contributions throughout a drainage can seriously degrade water quality. Unfortunately, nonpoint pollution is often difficult to remedy because of its dispersed sources, the large number of land managers involved, and the problem in quantifying the contributions from specific sites.

Mismanagement of the streamside or riparian zone is a major contributor to water quality problems across Montana. Most riparian problems are manifest as nonpoint pollution, with stream water quality suffering from numerous small "injuries" to the banks. Overgrazing, logging, road construction, and cultivation are the most common contributors to riparian zone degradation by removing the natural vegetative cover so important for bank stabilization. Such vegetative removal results in the addition of large quantities of sediment to the stream, changes in stream channel configuration and increased water temperatures, with consequent damage to aquatic life and other beneficial water uses.

Forest practices are gaining more attention as nonpoint sources of sediment. Road building and timber harvesting expose and compact the soil and in turn reduce its water-holding capacity, alter stream courses, and increase peak spring runoff. The result can be severe erosion, particularly in watersheds with naturally erosive soils. The U.S. Forest Service is planning increased road building on the national forests while private timberlands are being cut at a rate exceeding their expected regrowth capability. Erosion in forest watersheds is of particular concern in western Montana because many municipal water supplies and valuable fisheries depend on this source of water.

The legacy of hardrock mining also contributes to nonpoint water pollution in Montana. Seepage from old mine tailings and discharges from abandoned mines add

small pollution loads along many stream courses; the cumulative impact of these pollutants can severely limit aquatic life. Heavy metals, dissolved solids, sulfates, and acid waters are the greatest concerns.

Agricultural sources of nonpoint pollution are primarily expressed in bank erosion and sediment-laden irrigation return flows, and in dewatering, which increases water temperatures and diminishes the capacity of the stream to dilute pollutants. Perhaps the most severe water quality problem caused by agricultural activities occurs at Muddy Creek, a tributary of the Sun River west of Great Falls. Hundreds of thousands of dollars have been spent on the Muddy Creek Project during the last seven years to combat massive erosion which annually moves 200,000 tons of sediment and associated nutrients from the creek banks into the stream channel and down to the Sun and Missouri rivers. The cause of the Muddy Creek problem has been determined to be the unused irrigation water and excess return flows that keep the stream level unnaturally high; the solution, however, remains elusive. State and federal funds are supporting efforts to coordinate land and water management in the drainage.

The Teton River near Choteau has also been impacted by agriculture. Excess irrigation flows now are flushed through Priest Butte Lakes and Freezeout Lake where they pick up unnaturally high salt levels. Subsequent discharges to the Teton River have raised concern among downstream water users. A new flow release schedule adopted for the Freezeout Lake Wildlife Management Area by the Department of Fish, Wildlife and Parks has led to greater dilution of the saline water and thus improved water quality in the Teton River.

Management practices on Montana's cropland have been cited as significant sources of water pollution, particularly in relation to saline seep. Saline seep is caused in part by summer fallowing, in which cropland is plowed but not planted in order to allow soil moisture to increase to a level suitable for producing a dryland small grain crop the following year. During the fallow year, precipitation percolates down through the bare soil and dissolves the natural salts. This salt-laden groundwater then moves through the subsoil and may degrade shallow groundwater aquifers. When the saline groundwater resurfaces downslope, the results include contaminated soil that will no longer support beneficial vegetation. An estimated 280,000 acres in Montana are affected by saline seep. Preventative management practices have been developed, however, and successful control programs are being implemented in some areas of the state. Techniques are also available to reclaim the saline soils through the cultivation and cropping of salt-resistant plants.

Toxic blue-green algae have reached problem levels on three major Montana reservoirs (Hebgen, Nelson, and Canyon Ferry) during recent summers; the results in each case have included the deaths of livestock that drank the water and the closure of the waters to

recreational use. Abundant aquatic nutrients, coupled with particularly hot weather, result in an extremely rapid increase in blue-green algae populations, leaving the bays resembling pea soup.

Blue-green algae occur naturally in Montana waters and most blooms are not toxic. Researchers do not yet understand why toxic strains of certain blue-green algae species are dominant at some times and not at others. Montana recreationists and ranchers have been advised by the Water Quality Bureau to take precautions when faced with warm, algae-covered waters, as the conditions that have already resulted in toxic algae

blooms are likely to be repeated in future years.

Another biological agent, *Giardia lamblia*, is becoming an increasing problem in surface waters throughout the state. This one-celled protozoan causes giardiasis, a severe intestinal disorder that must be cured by medication. Rattlesnake Creek, formerly a major water supply for Missoula, has been closed for domestic use since 1983 when tests proved that its waters were contaminated with giardia. Although giardia may be removed by filtering, a filtering plant on Rattlesnake Creek would cost several million dollars. The city now depends on groundwater entirely to meet its water needs.

WATER POLLUTION CONTROL

A well-planned monitoring program is at the heart of every successful water pollution control effort. Water quality monitoring (the coordinated analysis of a series of water samples) is essential to document a problem, identify pollution sources, determine necessary remedial action, and assess the effectiveness of pollution control efforts.

The largest water quality monitoring project ever conducted by the WQB began in March 1984 on the lower Clark Fork River. The two-year effort will attempt to evaluate the effects of contaminants from various wastewater sources along the river. The project was prompted by a groundswell of public concern over the condition of the river when the Department of Health and Environmental Sciences was determining that a pulp mill west of Missoula could discharge wastes into the river on a year-round basis.

Thirty-one fixed water quality stations on the river and its major tributaries (the Blackfoot, Bitterroot and Flathead rivers) will be maintained during the study. Additionally, the two largest dischargers to the river (the Missoula municipal wastewater treatment plant and Champion International at Frenchtown) will expand their monitoring. Nutrients, heavy metals, sediments, and organic solids will be monitored closely to determine any biological impacts to the river. The results will be used to indicate whether additional discharge limitations need to be placed on municipal or other point sources.

The upper Clark Fork River is also the focus of an intensive monitoring effort, spurred by the federal Superfund effort to investigate and remedy

environmental damage caused by hazardous wastes.

The upper Clark Fork and its tributary Silver Bow Creek have been the recipients of nearly 100 years of mining and smelting wastes. During this period, aquatic life has been periodically devastated, and a legacy of metals and arsenic remains in the river sediments. Although some portions of the upper Clark Fork now have apparently healthy biota, including trout, major sections of the river remain far below their potential. The intensive monitoring program on the upper Clark Fork is intended to determine the sources and potential solutions to the problem of chronic heavy metal pollution and to record any changes in water quality resulting from reclamation and other pollution control efforts.

Near Bozeman, the East Gallatin River receives effluent from the Bozeman sewage treatment plant. Through the 1970s the river was plagued with excessive loads of ammonia, chlorine, organic solids, and algal nutrients. In 1982, the city began operating an advanced, secondary treatment plant, that has greatly improved the quality of the discharge. Monitoring on the East Gallatin indicates significant water quality improvements; continued monitoring will indicate whether the river has recovered sufficiently or whether other sources of contamination will need to be identified and controlled.

Eight types of programs address water quality problems in Montana:

- Abandoned Mine Land (AML) Program. Funded by a fee on coal production and administered by the federal

Office of Surface Mining through the Montana Department of State Lands, the AML program reclaims inactive mining areas that pose a threat to public health and safety. Thirty-six of the 70 listed problem stream segments qualify for AML funds, but there has been little implementation of water pollution control to date.

- **Agricultural Conservation Programs.** Water quality improvement is a goal of a number of programs sponsored by the Soil Conservation Service, Agricultural Stabilization and Conservation Service, Cooperative Extension Service, Montana Department of Natural Resources and Conservation (DNRC), county conservation districts, and the Montana Agricultural Experiment Station. One of the most successful efforts has been the Triangle Saline Seep Program, conducted by a consortium of county conservation districts.
- **Construction Grants Program.** The construction grants program, administered by WQB and partially funded by the federal Environmental Protection Agency, has been instrumental in improving the quality of wastewater discharges from municipal sewage treatment systems throughout Montana.
- **Instream Flow Reservations.** The 1973 Montana Water Use Act permits public agencies to reserve water in Montana's rivers and streams to protect water quality and fish habitat and to meet future consumptive uses. In 1980, the Department of Health and Environmental Sciences and the Department of Fish, Wildlife and Parks

received approval for substantial minimum flows in the Yellowstone River for conserving domestic water quality and fish and wildlife habitat. The departments have also begun to gather information for reservations in the Clark Fork and upper Missouri river systems.

- **Montana Pollution Discharge Elimination System (MPDES).** The MPDES permit system limits the amount and nature of point-source discharges from municipal and industrial sources. Permits are issued if discharges will meet water quality standards and will not impair existing water uses.
- **Water Development and Renewable Resource Development Programs.** These DNRC programs, funded primarily by the coal severance tax, provide grants and loans for a variety of projects that benefit water quality. Examples are erosion control, saline seep abatement, streambank stabilization, and irrigation system improvements.
- **Special Water Quality Improvement Projects.** This category encompasses many problem-specific water pollution control efforts, often supported by both state and local funds. Examples are the Muddy Creek project near Great Falls and the Whitefish Lake project in Flathead County.
- **Superfund.** The Superfund was established by Congress in 1980; the EPA administers the program to finance the cleanup of hazardous waste disposal sites. Four of the five Superfund sites identified in Montana are located on problem stream segments.

THE OUTLOOK

Montana's vast size and diversity result in an array of water quality impacts. The problems are widespread and many are not amenable to easy solutions.

Nevertheless, Montana water quality officials remain mindful of the goals expressed in the Federal Water Pollution Control Act: to make all surface waters fishable and swimmable and to eliminate pollutant discharges as much as possible. Although gasoline leaks, nonpoint pollution, hazardous wastes, and intensive forest development pose increased pollution threats, new programs are being developed to combat water

pollution. There is also growing recognition of the need for a comprehensive monitoring program to map and address changes in Montana's water resources.

State officials remain confident that they can hold the line against additional water pollution and begin addressing the backlog of polluted and threatened waters in Montana. Ultimately, however, Montana's success in preserving and enhancing water quality may depend on resources committed by local, state, federal and private watershed managers.

MONTANA'S GROUNDWATER

Groundwater contamination is widely accepted as one of the nation's largest environmental problems. Forty-five percent of Montana's domestic water delivered through public water systems and nearly all of the domestic water used in rural households comes from groundwater. Groundwater is also heavily used for agricultural and industrial purposes and provides a waste disposal medium.

Despite the importance of groundwater, Montanans show a complacency toward this resource when compared to their interest in surface water. One reason for this complacency is that Montana has not yet experienced the large-scale aquifer depletion and contamination problems evident in other states. But, as the pressures for use increase, conflicts arise and the need for a coordinated and coherent groundwater policy will become apparent. Montana now has the opportunity to develop a policy to prevent groundwater crises.

Public recognition of the state's groundwater resource

is important if prudent development of this essentially renewable resource is to occur. Evidence of public concern and interest in the resource was demonstrated during the Montana Groundwater Conference held in 1982. As a result of the conference, the Environmental Quality Council recommended appointment of a task force to develop a groundwater management strategy. Governor Ted Schwinden responded by naming a 16-member advisory council to develop recommendations to promote utilization and protection of the resource.

In its 1985 report, the Groundwater Advisory Council first identified the agencies responsible for groundwater management, then defined their respective duties. Next, the council addressed issues within four major areas: groundwater data and information needs, groundwater quality management, inter-agency coordination, and integrated groundwater management. The following summary of the council's report provides an overview of groundwater issues in Montana.

GROUNDWATER PROBLEMS

Spills and Underground Leaks

In recent years there has been an alarming increase in the number of reported instances of groundwater contamination associated with spills and leakage of underground pipes or storage tanks. Most of these cases involve petroleum fuels, but other chemicals also cause contamination. Undoubtedly there are many unreported instances of groundwater contamination throughout Montana.

The Montana Department of Health and Environmental Sciences (DHES) administers the state's groundwater quality programs; however, the department's authority to protect groundwater quality has historically been limited to remedial actions after contamination is discovered.

The council recommends three changes that would help alleviate problems of underground contamination: first, an inventory of abandoned, existing and new storage tanks; second, a system of monitoring for leaks in tanks and pipelines; third, a fund to support adequate cleanup of accidental spills and leaks. Many other states have found similar measures to be effective in preventing or dealing with leaks and spills.

The 1985 Legislature did authorize a contingency fund for emergency action by DHES when hazardous substances are released to the environment. The legislature also adopted new federal regulations designed to prevent leaks from underground storage tanks. These enactments implement most of the council's recommendations.

The DHES is limited in its ability to protect groundwater quality by a shortage of funding and the high costs of groundwater investigations. The council indicated that current policies should be reevaluated and additional funds dedicated to addressing the problem of leaks and spills.

Reserve Pit Problems

Reserve pits used in oil and gas drilling are potential sources of groundwater contamination. These reserve

pits are dug adjacent to oil or gas drilling rigs to hold wastes associated with rig operations. Highly saline in content, these pit wastes are often buried at the drill site after drilling is completed. Board of Oil and Gas Conservation regulations prohibit the storage of wastes in unlined earthen pits except when natural soil conditions preclude seepage. Some observers claim, however, that these requirements are inadequate.

Monitoring groundwater conditions near reserve pits is not mandatory; consequently the extent of groundwater pollution associated with the operation and reclamation of these pits is unknown. There are documented instances of groundwater contamination associated with reserve pits.

The Groundwater Advisory Council recommended that the state take steps to prevent groundwater contamination from reserve pits. It further recommended that the Board of Oil and Gas Conservation, which is charged with regulating oil and gas development in Montana, should assess the extent to which present reserve pit reclamation procedures threaten groundwater quality. In its assessment, the board's staff found that significant degradation of water quality over a widespread area is unlikely to occur.

Saline Seep

Saline seep is the transport by groundwater of excess salts from the subsoil to the topsoil. The crop-fallow system of dryland farming is one of the leading causes of saline seep in Montana. Saline seep has taken over 280,000 acres of cropland out of production. Shallow groundwater systems, the primary source of potable water in the region, are often affected. The contaminated water does not meet standards for domestic, irrigation, or livestock use.

Through the concerted efforts of researchers, farmers and agencies, effective saline seep control strategies have been developed and regional management plans have been instituted. There is not, however, a stable source of funding and the state's saline seep control program is in danger of grinding to a halt.

The council noted that the locally based, multi-county approach demonstrated by the Triangle County Conservation District has been highly successful in controlling saline seep and could serve as a statewide model. At the same time, it recommended that the state

consider stabilizing its funding for saline seep control and continue the local-state funding partnership necessary to correct saline seep groundwater contamination.

Hazardous Waste Disposal

Contamination of groundwater resulting from the improper disposal of hazardous waste poses a real threat to Montana. Principal sources include petroleum refining, pesticide manufacturing and other manufacturing processes. Most large quantities of hazardous wastes are transported out-of-state, but the future of this practice is in doubt as neighboring states become increasingly concerned about their ability to handle wastes generated within their borders.

Currently, many small volume hazardous waste generators dispose of their wastes in state-licensed sanitary landfills that are not properly engineered or managed to handle hazardous materials. Recent federal legislation will require businesses and industries that produce small volumes of hazardous waste to meet strict disposal requirements. But small hazardous waste generators are ill-equipped to handle this responsibility, and if they are refused access to city/county sanitary landfills by liability-fearing landfill operators, the generators may feel forced to dump at unauthorized sites.

The council recommended that Montana provide a greater incentive for hazardous waste generators to dispose of wastes properly and that it combine existing regulatory programs with measures that decrease the cost and logistical complexities of hazardous waste disposal. One possibility is a recommendation made by the Solid Waste Management Bureau of DHES and the Environmental Quality Council to establish a state-subsidized hazardous waste collection and transport system in Montana.

Aquifer Depletion

Aquifer depletion occurs when pumping upsets the natural equilibrium between groundwater recharge and discharge. Moderate instances of depletion are remedied by periods of recharge, but long-term reductions to an aquifer pose a serious problem. Although Montana has some authority to undertake depletion management measures, these are usually after-the-fact measures that do not reach the heart of the problem. A lack of data and inadequate support from area residents who do not

yet regard the problem as a serious economic threat are more fundamental concerns.

The DNRC, in conjunction with the Montana Bureau of Mines and Geology, plans to identify potential aquifer depletion areas. Data collection needs will be identified for each area and, if necessary, special controlled groundwater management areas will be designated.

Water Wells

Montana is faced with ever-increasing problems of inefficient use and contamination of groundwater but current regulations on well drilling do not adequately address these issues. Improper placement and construction of wells have been shown to deplete or contaminate aquifers.

The Board of Water Well Contractors has the authority to require specific well construction standards. The Groundwater Advisory Council suggested that the board exercise that authority to assure proper well placement and construction.

The problem of well driller qualifications is directly related to the problem of construction standards and well interference (when a well directly decreases the yield of another well). Although Montana requires the licensing of water well contractors, the work is sometimes performed by unlicensed drillers. This practice can result in improper well construction and inadequate log records. The Board of Water Well Contractors has had difficulty in overseeing these activities adequately, but by transferring the board and its responsibilities from the Department of Commerce to DNRC, better coordination of licensing, inspection and enforcement of well construction activities could be achieved. The 1985 Legislature adopted legislation to accomplish this transfer.

The council also noted that well logs, which are required by state law, are a critical source of hydrogeologic information for the state. Some drillers, however, fail to complete well logs or submit well logs that lack important information. Bonding requirements and a continuing education program for drillers were recommended to deal with this problem.

Quantity and Quality

Montana law provides for the protection of groundwater supplies, but it does not address the interaction of groundwater quantity and quality. The

quantity of groundwater withdrawals, depending on the aquifer's characteristics, can affect the quality of water. In some areas excessive withdrawal of groundwater results in low quality or contaminated surface water entering the aquifer, leading to rapid deterioration of the aquifer.

The Groundwater Advisory Council recommended

that this problem be addressed within the laws for special controlled groundwater areas. This recommendation was implemented by legislation allowing the formation or modification of controlled groundwater areas in response to water quality degradation resulting from excessive withdrawals and contamination migration.

INTEGRATED MANAGEMENT

Management Opportunities

Groundwater has tremendous importance and potential to Montana for agricultural, municipal and industrial needs, but it is often overlooked as a resource because of a lack of knowledge about its characteristics. Information is needed concerning: the location and extent of aquifers for irrigation development; the reuse of groundwater to dilute polluting irrigation return flows; and the opportunity to recharge groundwater aquifers for municipal drinking water supplies. The economic benefits of groundwater use must also be examined because surface water development is often far more expensive and less dependable than development of groundwater.

The Groundwater Advisory Council recommended that DNRC develop an educational publication to increase public awareness about the opportunities for groundwater development. The publication could also address the public's responsibility to protect groundwater resources.

Surface Water and Groundwater

Conjunctive use is a method of coordinating the use of surface and groundwater to satisfy a basin's water demands. A common form of conjunctive management is the artificial recharge of aquifers by increasing the rate of percolation. Artificial recharge can effectively use excess surface runoff to prevent unacceptable depletion of groundwater supplies, provide an economic

alternative to storage facility construction and minimize the need for surface distribution systems.

Artificial recharge requires that unappropriated surface waters be available. Typically these would be available during spring runoff. Because of seasonal fluctuations in the availability of water, conjunctive use would probably require the appropriation of dual water rights, each specified by the time of year that the right could be exercised.

Although it is practiced in scattered areas of the state, conjunctive use remains mostly inadvertent and haphazard. The Groundwater Advisory Council recommended that DNRC undertake site-specific research to promote conjunctive use. DNRC was also asked to encourage a demonstration artificial recharge project for Montana. Such a project might increase public awareness of the conjunctive use of groundwater as an alternative in solving water supply problems.

Interstate/International Considerations

Although there is not an immediate need to enter into groundwater compacts, Montana must recognize the possibility of future water shortages in aquifers that are shared with bordering states and Canadian provinces. Because of the time needed to negotiate interstate/international agreements, Montana would be well advised to begin these efforts now, before problems arise.

The council recommended intensified data collection efforts on shared aquifers and establishment of communication with Alberta and Saskatchewan. Montana also should maintain its commitment to the cooperative effort to monitor water levels and water quality in the Madison aquifer — shared with Wyoming, North Dakota, South Dakota, Utah, Idaho and Canada.

GROUNDWATER DATA NEEDS

The lack of information concerning groundwater underlies many of the problems outlined above. Data currently collected are fragmented and not readily available. Before Montana's groundwater resource can be managed effectively, a comprehensive, centralized data base must be developed. This data base would provide better and cheaper groundwater management.

The Groundwater Advisory Council recommended that Montana establish a Groundwater Information Center to collect, organize, evaluate and publish groundwater data. This center would carry out two major programs — maintaining a centralized data base and conducting field studies. Systematic recording of groundwater data obtained from well logs, aquifer tests, well inventories and groundwater samples would provide a centralized, easily accessible data base for participating agencies. The field program would focus research on areas of the state where information is lacking and on special problem areas identified by participating agencies.

The Montana Bureau of Mines and Geology currently maintains groundwater information as a service to the state. But increasing demands for information and an expanding data base have exceeded the bureau's capability. Funding for a Groundwater Information Center should be channelled through the Montana Bureau of Mines and Geology as the host agency, the council recommended.

Compilation of groundwater data is an on-going task requiring continuity and accuracy. A long-term, dependable source of funding must be secured for this work. State interest in funding such a program may be growing; the project has been recognized as a high priority by DNRC's Water Development Program and limited funding was provided by the 1985 Legislature.

The management of groundwater is a complex administrative problem. Numerous agencies, each with different expertise and jurisdictions, are involved in some aspect of groundwater management. Coordination between these agencies is desirable and necessary.

There are three major problems with the present lack of coordination. First, there is no assurance that research projects obtain all the information needed by all the agencies. Second, independent agencies may duplicate data already collected by other agencies or institutions. Third, the state may not be taking advantage of on-going groundwater investigations to build a current data base.

The Groundwater Advisory Council recommended that EQC and the Water Resources Research Center Advisory Council work to encourage interagency coordination of groundwater research and data-gathering. The council also supported the Groundwater Information Center as another means of avoiding duplication in data-gathering.

CONCLUSION

The importance of groundwater in Montana is evident from the fact that over half of the state's population relies on groundwater for domestic or agricultural needs. The state is in the best position to protect this valuable resource.

Montana could decide to do nothing to protect this important resource. During times of fiscal austerity such a choice is easy to make, but it ignores the long-term costs of inaction. Other states that have chosen this path now face serious problems of groundwater depletion and contamination. Aquifer contamination is not easily or cheaply reversed and will plague these states for generations.

The alternative is for Montana to develop a working knowledge of the state's aquifer characteristics and begin to consider management options. States such as North Dakota and Kansas actively invest in groundwater investigations aimed at promoting the use of groundwater. Many water districts in southern California pursue the conjunctive use of groundwater and surface water by storing excess surface water in groundwater aquifers. Montana could investigate similar actions to manage its water resources. Equally important, however, is to promote data collection and organization, and to enforce existing groundwater management and protection regulations.

WATER LEGISLATION IN THE 1985 LEGISLATURE

The importance of water to Montanans is demonstrated by the attention given to water resource bills each legislative session. The 1985 Montana Legislature was particularly concerned with water issues. In addition to two major pieces of legislation — House

Bill 680 (water policy) and HB 265 (stream access) — the legislature passed laws addressing the water appropriation system, water quality, border waters, water development, and dam safety. The following is a summary of 1985 water legislation.

WATER POLICY LEGISLATION

The Select Committee on Water Marketing concluded that major water policy revisions were necessary to protect Montana's interest in water resources in the state. Its recommendations, which resulted in HB 680, addressed out-of-state and out-of-basin water transport, the coal slurry ban, and the water adjudication and reservation processes.

HB 680 amended existing water permitting laws to protect the state from major water appropriations that might otherwise threaten Montana's present and future water uses. New public interest criteria were added for out-of-state diversions. These criteria do not, however, prohibit an out-of-state water transfer. Instead, they require additional review for applications involving out-of-state water transport to determine if significant harm could occur to Montana's citizens or if the proposal is contrary to water conservation practices in Montana. In addition, an application for a proposed appropriation or change in use greater than 5.5 cubic feet per second or 4,000 acre-feet, or for an out-of-basin use, means that the water may only be leased. The DNRC has authority to lease up to 50,000 acre-feet of water; larger leases need legislative approval.

A major debate by the legislature concerned the coal slurry ban. The ban was eventually rejected because of fears regarding its constitutionality and the associated liability for court costs if it was challenged and found unconstitutional. As a safeguard, large pipelines were placed under the Major Facility Siting Act.

HB 680 and its companion appropriations bill — HB 952 — provided funding to expand the water reservation process in the upper Missouri River Basin. Expanded water reservations will provide greater protection for Montana in its effort to obtain a fair share of the Missouri River Basin's water resources. In the water

adjudication area, HB 846 makes the issuance of a temporary preliminary decree in the Milk River Basin the highest priority in this process.

HB 680 also established a legislative water policy committee to advise the legislature on the adequacy of the state's water policy and to oversee the activities of the DNRC and other state agencies as they affect the state's water resources. The committee must evaluate the state water plan, the water development program, water-related research, and DNRC's water resources data management system, which is to be developed in cooperation with other state agencies, institutions, colleges, and universities.

A major water policy initiative of the 1979 and 1981 legislatures was promoted by the approval of a landmark compact concerning Indian reserved water rights. The compact was negotiated by the Reserved Water Rights Commission with the Sioux and Assiniboiné tribes of the Fort Peck Indian Reservation. Under the agreement, the tribes are entitled to a maximum annual water allocation of the lesser of 1,050,472 acre-feet or the quantity of water necessary to supply a consumptive use of 525,236 acre-feet. Of this quantity, no more than 950,000 acre-feet or the quantity of water necessary to supply a consumptive use of 475,000 acre-feet may be diverted annually from surface waters. This legislation was supplemented by Senate Joint Resolution 41, urging Congress to provide enabling authority for the Fort Peck tribes to enter into water agreements for the delivery, use, or transfer of water within or outside the reservation. The legislature also authorized the Reserved Water Rights Commission to continue to quantify water claims of other Indian tribes and the federal government, and provided for status reports to the chief water judge (SB 28).

WATER APPROPRIATION LEGISLATION

Several bills addressed more technical aspects of Montana's water appropriation system. In HB 396, the legislature provided DNRC with criteria for determining

if an application for a water use permit is not in good faith or does not show a bona fide intent to appropriate water for a beneficial use. These criteria include special

requirements if part of the water will be used by a consumer other than the applicant.

SB 223 provided an improved system for maintaining water right transfer certificates. Parties to water right transfers will now file a water right transfer certificate with the DNRC rather than the County Clerk and Recorder. In addition, each County Clerk and Recorder will submit monthly lists to the department of all realty transfers involving transfers of water rights.

HB 859 enables the DNRC to transfer to a district court hearings on a valid objection to a permit or a change of use in a permit. This transfer, which is

discretionary, requires a certification of the factual or legal issues by the department. The issues are decided by a water judge and the application is then remanded to the DNRC for final processing.

The requirements for establishing reserved water rights not yet put to use were clarified by SB 28. Claims must contain a variety of information, including the federal law on which the claim is based. Final decrees for such claims must contain specific information that defines the water right, including terms negotiated under a compact. Grounds for objection to a compact, and procedures for handling an objection, are also provided.

WATER QUALITY LEGISLATION

Bills advancing both groundwater and surface water quality concerns were passed by the 1985 Legislature. HB 711 outlined a county-option phosphorus ban. The optional ban is available to counties that have natural lakes experiencing phosphorus contamination and that are using other methods to control phosphorus contributions to surface waters. An effective date of July 1, 1986 was established for the legislation, giving the detergent industry opportunity to adjust its formulas and the Department of Health and Environmental Sciences time to develop a model ordinance.

Two successful bills enhanced the ability of the DHES to respond to water contamination emergencies. Under HB 187, district courts may award the DHES costs incurred in investigating and abating public water supply contamination. HB 766 created a special fund for emergency or remedial action by DHES when hazardous or deleterious substances are released to the environment. In non-emergency cases, DHES must first notify the liable party. If the responsible party fails to respond to the notice, DHES may clean up the contamination and charge its costs (and possibly punitive damages) to the party. The notice requirements, along with specified appeal procedures, are designed to make the procedure fair to the party deemed responsible.

Other legislation directly addressed groundwater concerns. HB 676 enabled the state to implement underground storage tank requirements mandated by recent amendments to the federal Resource Conservation and Recovery Act. Under the new laws, new and existing underground storage tanks will be

regulated to prevent leaks. The state law essentially duplicates the federal requirements, except that it allows regulation of agricultural and residential heating oil tanks and extends state authority to all underground pipes that deliver products from the tank to the dispensing unit.

Groundwater quality was also addressed by legislation (SB 365) permitting the designation or modification of controlled groundwater areas where excessive groundwater withdrawals would deteriorate groundwater quality.

Hard rock mining was a specific area addressed by water quality legislation. Clarifications adopted in HB 698 provide for metal mine operating permit applicants to supply baseline hydrologic data, plans identifying the design and operation of impounding structures, and the monitoring methods used to detect accidental discharges to groundwater or surface water. In addition, the reclamation plan for a mine must detail sufficient methods "to prevent the pollution of air or water and the degradation of adjacent lands."

The legislature provided funding for water quality projects with interest from the Resource Indemnity Trust (HB 922). The water quality projects ranged from the study and restoration of streams damaged by mining to a study of the effect of water quality on crop yields in the Powder River Basin.

The legislature also clarified that local health boards may adopt rules for the maintenance of treatment systems that do not discharge an effluent directly into state waters and that do not require an operating permit (HB 727).

STREAM ACCESS LEGISLATION

Two decisions by the Montana Supreme Court prompted new stream access legislation by the 1985 Legislature. These decisions stated that recreational water users had a right to use the streambed and banks up to the ordinary high-water mark.

In adopting HB 265, the legislature provided guidelines concerning the public's right to use surface water and streambeds. The new law defines "recreational use" as including fishing, hunting, swimming, floating, and boating; and the "ordinary high-water mark" as the line below which water has changed the characteristics of the land. Stream use is limited to the area within the ordinary high-water mark, though the public may portage around artificial barriers that obstruct recreational use of the water.

Certain recreational uses require landowner permission, depending on whether the stream is designated Class 1 or Class 2. Class 1 streams are officially declared navigable or are capable of some commercial use; all others are Class 2 streams.

Several other provisions address the rights of the

public and the landowner. Either a landowner or a member of the public may request the adoption of an exclusive portage route. Liability for injuries incurred by recreational users of streams on private property is restricted, and the landowner's title to land is protected by outlawing prescriptive easements acquired through recreational use of a stream, streambed or bank, or portage route. In addition, the public may not enter or cross private property to reach water without the permission of the landowner. These requirements and other provisions of the stream access law will be clarified under rulemaking authority delegated to the Fish and Game Commission.

In a separate piece of legislation (HB 520), the legislature clarified that the public does not have a right to make recreational use of surface waters that have been diverted for purposes of appropriation. These waters include irrigation and drainage canals or ditches, flood control channels, and municipal, industrial, and domestic water systems.

BORDER WATERS LEGISLATION

International aspects of Montana's water were also addressed by the legislature. HB 488 created a Montana-Western Canadian Provinces Boundary Advisory Committee to pursue common goals and to promote understanding on issues ranging from water and natural resources to agriculture and economic development.

Two projects relating to border waters were funded from Resource Indemnity Trust interest proceeds. The Cabin Creek project will ensure adequate state participation in the reference to the International Joint Commission on the Cabin Creek coal mine issue. Critics

claim the proposed mine just north of the U.S. border could cause water quality problems in the Flathead River and Flathead Lake. The other project analyzes the potential for a joint impoundment of the Milk River to store water for Alberta and Montana.

The legislature also passed a joint resolution (SJR 16) urging Montana and Wyoming to negotiate basin management plans for the Powder River and other Yellowstone Basin tributaries. Topics to be discussed include information exchanges, criteria for evaluating proposed developments, and the potential for joint water projects.

WATER DEVELOPMENT LEGISLATION

The legislature ranked 52 water project applications for grants and loans under the DNRC water development program (HB 947). Because of a limited budget, however, not all projects will be funded. The projects include groundwater studies, saline seep projects, water and sewer projects, irrigation projects, and stream stabilization projects. Additionally, several water-related projects were funded from Resource Indemnity Trust interest money.

HB 947 also directed the DNRC to give particular attention to agriculture in formulating its water development programs. In addition, DNRC and the legislature are directed to give preferential consideration to water projects that promote the state's water reservation program, the state water plan, and other programs recommended by the legislative Water Policy

Committee.

The state water development program was amended by HB 283, which allows the issuance of bond anticipation notes. This will allow project developers to obtain, in certain instances, quicker project funding. In addition, DNRC is authorized to lend up to 10 percent of available water development account money to state and local government entities with emergency water-related needs.

The adoption of HB 273 formalized requirements for contracts on state-owned works. These requirements include DNRC approval of plans, drawings, bond issues, and change orders, and DNRC selection of project contractors according to a competitive bid (in most cases).

OTHER WATER-RELATED LEGISLATION

The Natural Resource Data System Advisory Committee proposed and received legislative approval to operate a natural resource information system and a Natural Heritage Program (HB 860). The natural resource information system, which is administered by the Montana State Library, will create a centralized inventory and management system for natural resource data, including water information. The Natural Heritage Program will collect, store, and disseminate information on special flora and fauna in Montana.

Recommendations from the governor's Groundwater Advisory Council resulted in significant changes to the laws affecting water well contractors and drillers (HB 739). The bill transferred administration of the Board of Water Well Contractors from the Department of Commerce to the DNRC and gave the board added authority to specify water well construction standards. In addition, the new laws define a "water well driller," and require the water well driller to obtain a license

from the board unless the drilling is for his own residential or agricultural purposes or for another water well driller or contractor.

Extensive dam safety provisions were also adopted by the 1985 Legislature (SB 369). Emphasis is on plan approval, permitting, and inspection of high-hazard dams, and emergency actions necessary to prevent or respond to dam failures. A high-hazard dam is a dam or reservoir that would, if it failed, probably cause loss of life. The DNRC received authority to classify these dams and to establish safety standards, inspection and permitting requirements, and emergency procedures.

Senator Dave Manning was honored by SJR 29, which recognized his efforts in promoting off-stream storage hydropower development in the Yellowstone River Basin. The resolution cited the potential for energy generation and economic development from these projects, and asked the DNRC to collect information about these projects and their water needs.

MONTANA'S PLURAL WATER POLICY

Because water touches and is touched by most human activity, it is not surprising that Montana is having difficulty in adopting a comprehensive water policy.

Water policy faces two kinds of constraints. Natural constraints are the precipitation regime, the terrain and other physical factors. Institutional constraints are history and custom, Montana law and policy, federal law and policy, and court interpretation of existing water rights and obligations.

Montana water policy is the product of many voices over many decades. The various elements of Montana's policy are often in contention and sometimes in conflict with each other.

Water policy is made in response to pragmatic needs. It is usually a function of water scarcity or a growing competitive intensity among water uses. Calls for decisive water policy in Montana can be viewed as a sign of growing appreciation of the likelihood of future scarcity.

Some water policy elements are constitutional, some are legislative, and some result from case law. Some are self-motivated, others are a function of operating within the shared jurisdictions of state/federal relations, and still others are part of river basin agreements with adjacent states.

BASIC WATER POLICY CONSIDERATIONS

Ownership

The Montana Constitution proclaims that the state owns the waters arising within its borders. This proclamation affects primarily the relationship between government and citizens within Montana; private citizens cannot "own" water. This is a legal fiction, however, in regard to the relationship between Montana

and other states, and with the federal government. Montana cannot, for example, prevent out-of-state citizens from claiming the water once it leaves the state.

Use

Under state law, persons must obtain permits from the Department of Natural Resources and Conservation to put water to any of the following beneficial uses:

agricultural, domestic, fish and wildlife, industrial, irrigation, mining, municipal, power, and recreation. The state has therefore decided that some uses are beneficial and others are not.

Rights

Persons have the right to use water in Montana under the doctrine of prior appropriation. Earlier claims are superior to later claims but, in most cases, no particular type of beneficial use is superior to another. If a beneficial use is abandoned other persons may claim the water.

Adjudication

Beginning in 1973, the state began keeping records of new water use permits in Montana. In 1979, inspired mainly by concerns over potential shortages in the Yellowstone River Basin, the state required that pre-1973 water rights claims be recorded and adjudicated. Part of the purpose of adjudication is to determine if any water remains to be appropriated. The state also established the Reserved Water Rights Compact Commission to bargain with Indian tribes and federal agencies over their claims to water arising within Montana's borders.

Reservations

A special feature of Montana law allows for the suspension of new water claims if there is concern that a basin is over-appropriated. Rivers, thereby, can be closed to further appropriation. Before closure the state may also reserve some water for future uses. This provision allows the state to decide that some beneficial uses are superior to others and to allocate future shares accordingly. The reservation process has already been completed on the Yellowstone Basin.

Conservation and Development

One way to expand the availability of water for beneficial uses is to store or divert it and to transport it from wet to dry areas. The state and the federal government have built storage and diversion projects in cases where the total benefits of the projects are calculated to exceed the costs. Hydropower, flood control, irrigation, navigation, and recreation are examples of uses or benefits resulting from these developments.

Quality

The federal government assumes primary responsibility for setting water quality standards, though states may set more stringent standards. States enforce these standards. Many of the state's point source pollution problems are directly addressed by municipal and industrial water treatment plants; whereas nonpoint pollution is addressed by programs implemented most frequently by conservation districts. In addition Montana recognizes the relationship between water quantity and water quality and limits stream dewatering that could reduce the stream's capacity to absorb pollutants.

Instream Flow

In addition to reserving instream flows for water quality objectives, the state has decided that water's common property dimensions — fish and wildlife, aesthetic, ecological — justify limitations on withdrawals and streambed alterations. Instream flow requirements place ceilings on consumptive uses. This concession demonstrates how the prior appropriation doctrine coexists with the riparian doctrine, which emphasizes the right of all persons along a stream to share the benefits of the water.

Public Access

There are growing disputes between landowners, who claim ownership of stream banks, and recreationists, who claim public access rights to the rivers and streams for fishing, floating and other purposes. The Montana Supreme Court has acknowledged the rights of recreationists to use stream and river banks between high and low water marks.

State Water Plan

The Montana Water Resources Act of 1967 charges the DNRC with creating and updating elements of a state water plan to encourage wise conservation, development and use of the state's water resources. Planning occurs within major river basins and their sub-basins, usually in conjunction with federal agencies. The plan is supposed to document resources, inventory uses and project shortages. Many aspects of the plan have been completed, but no plan approved by the Board of Natural Resources and Conservation has been submitted to the legislature.

THE MISSOURI RIVER BASIN

INTRODUCTION TO MISSOURI BASIN ISSUES

The 1981 Montana Legislature charged the DNRC with developing a strategy for the protection of Montana's share of the water in the Missouri River Basin. This charge was in response to claims for water from downstream states. In 1983 the legislature created the Select Committee on Water Marketing to explore ways in which Montana might be able to market its share of surplus water expected to be found in the Missouri Basin. These two major studies clarified the general question of how the state should act to maximize the benefits of its water resources, especially in the Missouri Basin. How can the state of Montana "own," "control," or "manage" the water that arises within the state? What kind of approach to water management, regulation or policy does Montana require if it expects

to cope with a future of uncertainty and greater demands upon its water?

Water marketing was a highly publicized and controversial issue during the 1983 legislative session, placing Montanans at odds with each other. The legislature considered several approaches to water marketing, and legislators became increasingly concerned about how water marketing falls within the state's general water management schemes. The result was predictable: an interim study. As the interim study progressed, it became clear that the answers were important not only to Montana; water marketing and related water management options have policy implications and intergovernmental applications that warrant national attention. The Select Committee on

Water Marketing encountered complex questions in several important categories:

water marketing arises from management practices that leave a surplus of water.

Technical Questions

Is there any water that is surplus to Montana's needs?
Can more water be moved from surplus areas to dry areas?

Economic Questions

How can we assign value to water?
Is there a user fee or other regulatory approach that could make water marketing worthwhile for the state?

Legal Questions

Can Montana deny some claims to the use of water while it tries to sell water to other prospective users?
Can Montana prohibit or restrict out-of-state or out-of-basin transfers of water?

Policy Questions

What protection should Montana provide for future uses of water?
For what purpose might Montana want to market its water?
How will Montana protect its fair share of water in the Missouri River Basin?

The Select Committee attempted to address the relationships among these sets of questions and found that answers to some questions depended on unknown answers to others. The state certainly needs help from a variety of experts — technical, legal, economic — to assist in deciding how to implement a water policy. However, the technical, legal and economic advice is not a substitute for the policy responsibility faced by Montana officials. What policy is desired by Montanans? The experts can tell us what is possible but not what is preferable.

Water marketing may have seemed to be the most timely aspect of Montana water policy to the 1983 Legislature, but it is only one component of a broader, long-term water management dialogue. Water marketing can be seen as both cause and effect in relation to other state water management elements. It is cause in that proceeds from the sale of water can be dedicated to development projects that enhance the use of existing water supplies. It is effect in that the opportunity for

LINCOLN SEMINAR PAPERS

The Lincoln Seminar papers, commissioned jointly by the Select Committee on Water Marketing and the Lincoln Institute of Land Policy, were presented at a seminar for the Select Committee held July 13-14, 1984 in Billings, Montana. Papers were prepared by water policy experts from Montana and other western states where water scarcity has become a prominent issue. Collectively, the papers represent current critical thinking on important water policy initiatives.

Policy initiatives discussed as water management approaches included: increased development of Montana's water resources; continued reservation of water under Montana's water reservation laws; state appropriation of unappropriated water; state marketing of surplus water; compact negotiations with other basin states; implementation of a free market system; and establishment of a state regulatory system in accordance with the public trust doctrine.

Debate over these policy initiatives often resembles a "Gordian knot": one that defies unraveling. It might help to recognize the various initiatives as tools, each with an intended purpose. We then won't waste time by considering the wrong tool for the desired purpose. The most common error is to expect tools that decide how water should be allocated within Montana to also determine how much water Montana can claim against downstream users.

The Lincoln Seminar papers address the apprehension of headwaters states over potential limitations on their prerogatives regarding water in three general categories: (1) limitations on the ability of a state to protect unappropriated water for future uses within the state; (2) prohibitions on the ability of a state to deny the export of its water; and (3) constraints on the ability of a state to profit from the sale of its water for out-of-state uses.

Montana's concerns fall under all categories. In the first instance, senior claims associated with growing water use in the downstream states of the Missouri Basin

could preclude future water development within Montana. In the second instance, there is concern that the state has no legal basis to prohibit the export of water outside the state, or even to forbid the use of water to make coal slurry for transfer to points outside Montana. In the third instance, because of the recent efforts of South Dakota to sell water, questions have

been raised about the ability of Montana to sell its water for use outside the state. The seminar papers are presented and discussed in this order, even though the authors do not always limit themselves to a single topic.

The final topic cuts across all three categories to compare “free market” to “state market” approaches to allocating water.

GROUP ONE: PROTECTING STATE WATERS FROM DOWNSTREAM WATER CLAIMS

The first group of papers addresses primarily the matter of protecting Montana's unappropriated waters against claims from downstream states. While water sales and the coal slurry ban are more salient issues, the amount of water that could be lost to downstream states by default poses a far greater concern. Montanans interested in conserving water for future in state uses should be at least as concerned about this aspect of “protection” as they are about the coal slurry ban. Moreover, people interested in the state's selling of water realize that revenues from sales could be dedicated to water development projects that would, in turn, protect more water by putting it to consumptive use.

What are the policy tools that directly address the issue of protecting state waters? They include: developing water through consumptive uses; reserving water for future consumptive and instream uses; compacting with downstream states to divide water; and dealing with congressional or court action that could prohibit certain uses or diversions of water.

Conservation proposes to follow. The strategy includes many initiatives and does not recommend one to the exclusion of the others. It suggests, however, that some initiatives require more immediate action. Fritz argues that the surest way to protect future uses of water against claims from downstream states is to put the water to a consumptive use now. Without the financial resources to impound, divert and distribute more water, Montana must rely on the implementation of a carefully planned system to reserve water for future uses as the next best defense. This action, if successful, could encourage downstream states to discuss compacting as a fair way to apportion the water.

Fritz also explains how water marketing, on a selective basis, can be fitted to the “use it or lose it” philosophy: some of the proceeds from the sale of water could be dedicated to water development projects that would put more water to beneficial consumptive use within the state.

Sherk

George William Sherk's paper discusses ways that courts and Congress settle water conflicts between upstream and downstream states. In cases involving one

Fritz

Gary Fritz explains the water management strategy that Montana's Department of Natural Resources and

state versus another, the Supreme Court can exercise original jurisdiction and resolve the conflict under equitable apportionment principles. The complaining party must, however, demonstrate by “clear and convincing” evidence the need for an equitable apportionment of the water by the court. Congressional involvement could occur either through approval of a compact entered into by the Missouri River Basin states or by legislation affecting the ability of the upstream states to regulate water.

Paradoxically, neither Congress nor the courts are likely to become involved if Montana takes a passive role toward water development or water marketing. The risks of federal preemption are heightened by an active policy that would put water to consumptive use upstream and establish senior appropriation claims. Downstream states may grow increasingly apprehensive over diminished flows which decrease their own options to use water, and they may press for apportionment by legislative or judicial bodies.

Weatherford

Gary Weatherford reviews the experience of the Colorado River Basin compact for lessons that might be applied to Montana's concerns. The Colorado case provides two models. In one model, the entire basin could first be divided between the upstream and downstream states prior to any allocation among individual states. In the second model, the water could be allocated among all the states.

Compacting is likely to occur only when there is a common perception of gain or a mutual fear of loss. That is why it may not now be a promising solution for the Missouri Basin. The states, however, may decide to compact if they jointly want to avoid having a decision come from Congress or the courts. On the other hand,

some states may hold out on compacting precisely because they expect a more favorable outcome from these outside authorities.

Compacts are also not the total answer to water allocation problems. Rarely do parties reach consensus on all issues. Moreover, the assumptions that underlie any compact impose an element of risk in compact-making. Years later, market conditions may make a compact look either very good or very bad.

O'Keefe

Mark O'Keefe suggests that the state's special approach to protecting future uses in the Yellowstone Basin might be applied to the growing concerns over disputed claims to Missouri River water. The Yellowstone reservations set aside quantities of water for future uses in certain beneficial use categories — irrigation, municipal use and instream flows. The Montana reservation system will acquire greater credibility if Yellowstone water is put to use in accordance with these reservations.

It is uncertain how well the reservation process can be adapted to the Upper Missouri Basin. In the first place, a reservation system must go hand-in-hand with quantification of existing uses in order to be an effective planning tool. In the second place, the Yellowstone reservation system was designed to deal with competing in-state uses; in the Missouri, the concern is for protecting in-state uses from competing out-of-state downstream uses.

Another complicating factor is the federal reserved rights to water in the Missouri Basin. The effect of these rights on future state rights to water will not be known until all rights are quantified.

SUMMARY

Water development, water reservations, compacting and apportionment are strategies that address the interstate allocation of water. There are complex and dynamic relationships among the options. For example, Montana may not need to compact if it can develop its own impoundment systems now to meet future in-state needs. Some people, therefore, favor the systematic development of water over compacting. Others recognize that this expensive approach could diminish water for instream uses.

Many argue that compacting and water development should be pursued simultaneously. As a strategy, water development might persuade downstream states to accept compacting. An aggressive water development program could either prompt a compact or obviate the need for one. A compact, prior to further development for consumptive uses, would allow the state to decide the proper balance between consumptive uses and instream flows.

Gary Fritz

A WATER PROTECTION STRATEGY FOR MONTANA IN THE MISSOURI RIVER BASIN

Many Montanans are concerned that the water flowing out of the state will soon be claimed by downstream states whose use of the water is growing more rapidly than ours. It is also feared that given the political power of the lower basin states, we could find it difficult to defend our claimed right to future instate use

of water in a national political arena. Therefore, the 1981 Montana Legislature directed the Department of Natural Resources and Conservation to develop a strategy to protect Montana's option for future instate water use in the face of expanding water development by downstream states.

Before discussing the proposed strategy developed by the department, let us first look at the water supply situation in the Missouri River Basin, the threats to the use of its waters and other information that provided the department with a foundation to develop the strategy.

Montana and Wyoming hold the headwaters of the Missouri River. Together with its major tributary, the Yellowstone River, the Missouri River flows through Montana, downstream through North Dakota, South Dakota, Nebraska, Iowa, Kansas, and Missouri.

Montana is an important contributor of water to the Missouri River system. The average annual outflow from Montana in the upper Missouri River adjusted at the 1975 level of development is 7,774,000 acre-feet per year; at the Montana-North Dakota state line the average flow of the Yellowstone River is about 8,804,000 acre-feet per year.

Montana contributes about 50% of the average streamflow at Sioux City, Iowa (21,725,000 acre-feet per year), and 19% of the streamflow at the mouth of the Missouri River (54,559,000 acre-feet per year) near Hermann, Missouri. Montana and Wyoming together contribute 76% of the streamflow at Sioux City, Iowa, the division point between the upper and lower basin, and the starting point for navigation.

The potential for conflict in the Missouri River Basin involves the 1944 Flood Control Act, which authorized the Pick-Sloan Missouri Basin Program. This program is a compromise of two plans, one by the Army Corps of Engineers (the Pick Plan) and the other by the Bureau of Reclamation (the Sloan Plan). The Corps plan focused on the construction of large mainstem reservoirs on the Missouri River for flood control and the development and maintenance of downstream navigation. The bureau plan involved the development of water for consumptive purposes, primarily irrigation.

In passing the act, Congress authorized a system of six mainstem reservoirs, including the existing Fort Peck Dam, to control floods and to provide navigation in the lower Missouri River Basin. Hydroelectric power produced at these mainstem dams and other dams in the upper basin remain an important source of energy, primarily for the lower basin and for metropolitan areas east of the basin.

Beside the flood control and navigational benefits, Congress recognized the importance of water development for other purposes and authorized many irrigation projects and storage reservoirs throughout the upper and lower Missouri River Basin. Most importantly, Senators O'Mahoney and Milliken from Colorado and Wyoming had the foresight to realize back in 1944 that the lower Missouri Basin states would attempt to preclude future consumptive use development by the upper basin states. These senators introduced, and Congress adopted, the O'Mahoney-Milliken Amendment which specified that

providing streamflows for navigation was not to interfere with upper basin development of water that arises west of the 98th Meridian. This action provided water for consumptive uses in Colorado, Montana, Wyoming, South Dakota, North Dakota, Kansas, and Nebraska.

Today, the perception of the Pick-Sloan Missouri Basin Program is different than that initially conceived by its authors. The lower basin states have been receiving most of the benefits from the 1944 act since the mid-1960s, when the last of the six mainstem reservoirs was completed. These reservoirs have provided the lower basin states with a barge transportation industry that almost guarantees a 300-foot-wide channel, eight feet deep, for nine months of the year. The Corps of Engineers has estimated that flood control benefits accrued primarily to the lower basin states are in excess of \$1.7 billion. The lower basin and urban areas east of the basin have been receiving about 68% of the hydropower generated from the mainstem system; the upper basin receives about 32%.

All the mainstem reservoirs are in three states—Montana, North Dakota, and South Dakota. These states have surrendered vast acreages of productive valley land to inundation. Montana alone gave up over 500,000 acres for Fort Peck Reservoir. In return for this land, and for providing the benefits of flood control and hydropower generation, the upper basin states were promised the development of consumptive uses under the Pick-Sloan Plan. To date, only about 8% of the federal water projects intended for consumptive purposes have been completed and most of the contemplated projects have not been started. Meanwhile, consumptive uses by downstream states have expanded more rapidly than in the upper basin. In 1949, upper basin states used more than half (54%) of the irrigation water on nearly 3 million acres. By 1978, the situation had been reversed—lower basin states used nearly three-quarters (72%) of the irrigation water to service 9.5 million acres. In that same year, lower basin states also used over 10 times as much water (404,500 acre-feet per year) for energy-related depletions than was used in the four upstream states (38,400 acre-feet per year). However, it should be noted that water for irrigation and energy development is supplied from both surface and groundwater within the basin.

Montana is presently irrigating about 2 million acres, but over 9 million more acres are irrigable. The Flood Control Act apparently allocated water to irrigate 5.2 million acres among the Missouri Basin states; well over 1 million of those acres are in Montana. Montanans have been slow to develop these acreages (only about 5% have so far been put under irrigation), but we are still entitled to develop these lands today as we were in 1944.

Recent water development actions by the upper basin states have initiated the conflict between the upper and

lower basins. The lower basin states perceive upper basin development as a threat because they do not want to lose any of their existing benefits and they also want water available for their future consumptive development. Thus, they have begun to challenge upper basin development in order to prevent additional upstream consumptive uses. These and other challenges to Montana take many forms, a few of particular concern are described below.

Energy Transportation Systems, Inc. (ETSI) has purchased 50,000 acre-feet per year of Lake Oahe water from South Dakota and the Bureau of Reclamation. ETSI plans to transport Missouri River water 280 miles to coal mines near Gillette, Wyoming. From there, the water would be used to slurry Wyoming coal 1,600 miles to power plants in Oklahoma and adjacent states. Although this quantity of water is only about two-tenths of 1% of the average annual flow (21,725,000 acre-feet) at Sioux City, Iowa (equivalent to one-eighth to one-tenth of the total water that evaporates each year from Oahe Reservoir), the states of Missouri, Iowa, and Nebraska are concerned that this sale and interbasin transfer of Missouri River water are only the tip of the iceberg.

Several pieces of legislation have been introduced in Congress by the lower basin states to control upstream water use. Representative Bedell of Iowa introduced legislation to prohibit any state from selling or otherwise transferring interstate any waters located in the state for use outside that state unless all other states in the basin consent to the sale or transfer. If passed, this bill would have the effect of prohibiting all sales and interbasin transfers from the Missouri River Basin. During the last two sessions Representative Young of Missouri has introduced a bill that would grant the consent of Congress to the states of the Missouri River Basin to negotiate and enter into an interstate compact for the equitable allocation of the waters of the Missouri River Basin. Disturbing features of the first bill required that any compact or agreement not cause deterioration in the water quality of any state of the Missouri River Basin and not reduce the navigational capacity of the Missouri River.

In addition, the proposed water sale by South Dakota sparked two lawsuits (*the States of Missouri, Iowa and Nebraska vs. Colonel Andrews Jr. et al.*, and *Kansas City Southern Railway Company et al. vs. Colonel Andrews Jr. et al.*), which were filed August 1982 in the U.S. District Court in Nebraska. These suits attempt to halt the ETSI sale and diversion, contending that the Department of Interior unlawfully approved the 50,000 acre-feet per year depletion and that the Corps of Engineers unlawfully issued a permit for construction of a water intake facility to make the depletions possible. The overtones to these two lawsuits suggest that the lower basin states would like to curb future depletions in the upper basin by having the 1944 Flood Control Act

reinterpreted. The district court recently ruled in favor of the lower basin states and the railroad that the Bureau of Reclamation did not have the authority to market water from the mainstem reservoirs. It is my understanding that the bureau plans to appeal the decision. If the decision holds, the water marketing contract between the bureau and Montana for 300,000 acre-feet per year from Fort Peck Reservoir will be invalid. [Ed. note: *The project was later abandoned by ETSI.*]

The High Plains Study authorized by Congress in 1976 proposes alternatives that have been perceived as a threat to Montana and the other basin states in the future. This \$6 million Department of Commerce study looked at alternatives for assuring adequate water supplies to the High Plains states, where the Ogallala aquifer is being rapidly depleted. By the year 2020, groundwater depletions in this area are estimated to result in a loss to irrigation of more than one-third of the 14.3 million acres now supplied from the Ogallala aquifer. The High Plains Study Council, consisting of the governors of the six High Plains states, has chosen several mitigating solutions, but the only long-term solution is to import water into the High Plains region. Two of the four import alternatives would divert about 4 million acre-feet per year from the Missouri River at either Lake Francis Case behind Fort Randall Dam or at St. Joseph, Missouri. This could possibly force the lower basin states to demand more water from the upper basin to meet their existing and future needs.

All of the other upper basin states are attempting to strengthen their position in negotiation or litigation by identifying water development priorities for the 1980s. For example, North Dakota's top priority is to develop 250,000 acres of irrigated land with water from the Garrison Reservoir Project. South Dakota wishes to withdraw 1.5 million acre-feet per year for irrigation in the Central South Dakota Project (CENDAX). Wyoming has authorized \$114 million for water development as a first step in a possible six-year, \$600 million statewide water development program.

Threats to upstream Missouri River water use could also arise from studies by the Army Corps of Engineers. The Missouri River Division of the Corps is completing a study of Mississippi River navigation that includes an analysis of the effects of Missouri River flows. Navigation on the Missouri River annually produces about \$20 million in benefits from the transportation of 3 million tons of freight and uses almost the entire flow of the river. In contrast, more than 50 million tons are transported annually on the Mississippi River. Preliminary results of the study indicate that regulation of the Missouri River has a significant effect on the flows of the Mississippi River. No current authorizations relate the Missouri River regulation to benefits on the Mississippi, but the Corps of Engineers study could lead to suggestions that Congress consider such

authorization. Additionally, the Corps had been contemplating the development of a railroad-barge system which would allow barge traffic to transport 17 million tons of coal per year downstream from Sioux City, Iowa. This would increase total barge tonnage to the projected level of 20 million tons per year, and would only intensify the problem between the upper and lower basin states.

Studies completed by the Department of Natural Resources and Conservation in 1982 indicated that a real problem in the mainstem of the Missouri may arise sometime after the year 2000. By that time, upper basin depletions are projected to increase by 1.6 to 1.7 million acre-feet per year above the 1975 level of development and could affect navigation. However, actual harm to downstream navigation would not occur unless the basin states experience a prolonged drought similar to the nine-year drought of the 1930s.

On the other hand, restricting development in the upper basin to maintain existing streamflow for navigation in the lower basin would probably have a major economic impact on the irrigation and energy/coal sectors. A preliminary economic analysis indicates that, in Montana alone, potential crop values of between \$35 and \$69 million (in 1980 dollars) could be lost in the year 2000, while lost energy-related taxes in the same year could range from \$233 to \$476 million. Similarly, in the remainder of the Missouri River Basin, restricting future water development for consumptive purposes could result in lost irrigation crop revenues amounting to between \$71 and \$674 million per year in the year 2000. For the year 2020, the losses could range between \$58 and \$987 million. Benefits for navigation would not increase by the year 2000 and would only range between \$2-5 million dollars by the year 2020. Benefits from hydropower would increase by \$13-24 million by 2000 and \$14-29 million by 2020. These very tentative economic predictions suggest that the highest valued use of the water is for consumptive purposes in the basin and not for navigation and hydropower production. They also indicate that by restricting consumptive use development to maintain flows for nonconsumptive uses, the basin could experience significant economic consequences.

The report also reviewed the three ways water has been apportioned among states; equitable apportionment (water apportioned by the U.S. Supreme Court to settle disputes brought by a lawsuit among states); Congressional apportionment (action taken by Congress to settle water disputes among states); and interstate compacts (negotiated agreements among the states to administer water shortages, to divide water surpluses, or to provide planning and regulatory functions). The best way to resolve the differences between the upper and lower basins is through compact negotiations. Negotiations should be much less costly and more responsive to state needs. Today, most of the states have indicated that they are not ready to negotiate

a compact for they realize that negotiations would be based more upon emotional and political concerns than on the factual information and an understanding of the future water needs of each state. We hope within 15 to 20 years, all the states will be in a position to negotiate an apportionment on the Missouri River. If compact negotiations break down, the upper basin would receive better treatment under equitable apportionment by the U.S. Supreme Court based upon the O'Mahoney-Milliken Amendment of the 1944 Flood Control Act than under Congressional apportionment. Congressional apportionment may not be equitable to the upper basin because these states do not have the political power of the lower basin.

Using the information presented above, the department was able to develop a proposed strategy to protect Montana's options for future in-state water use in the face of expanding downstream water development. The strategy is composed of six main components. It involves building up our defenses, reading an offense, and providing sentinels to give advance warning of impending conflict or challenge to the use of our share of the Missouri River.

The first component of the strategy points out that Montana should rely on the 1944 Flood Control Act and particularly the O'Mahoney-Milliken Amendment as its first line of defense. Like the other upper basin states, Montana should insist that the act has established a water allocation in the Missouri River Basin. This state should adopt the stance taken in 1965 by the Senate Interior and Insular Affairs Committee when it reported on legislation for the Garrison Project:

At the same time, however, the fundamental commitment of the Flood Control Act of 1944 should be recognized. It amounted to a compact, ratified by Congress, assuring the upper basin states that their sacrifice of productive lands to provide benefits for the lower basin would be compensated for by full development of other potentialities in the upper basin states.

The second component of the strategy deals with the need to monitor actions of either Congress or the other basin states that potentially threaten the Flood Control Act and, specifically, the O'Mahoney-Milliken Amendment. If legal action jeopardizes our interpretation of the law, Montana must respond promptly and effectively.

Third, we must carefully monitor water development activities in the other states to assure that they will not preclude or unnecessarily limit future water use in Montana. We must also be alert for Congressional actions that would lead to the authorization and funding of downstream projects that would develop a large water supply and subsequently foreclose our future options to Missouri River water.

As a fourth element, Montana should promote a negotiated resolution of the Missouri Basin conflict and discourage confrontation. We should use the 1944 Flood

Control Act as the framework upon which to build a negotiated settlement. All basin states have interests in the Missouri River and its tributaries, and they should work to resolve their differences through discussion and negotiation, rather than litigation or congressional intervention. Just as they share the same river, the basin states should share the same negotiation table. Perhaps agreement cannot be reached through honest and forthright discussion. But any subsequent litigation or Congressional action would at least be based on meaningful and understandable differences rather than emotional contrivance.

Discussions among the basin states have already begun under the auspices of the Missouri Basin States Association (MBSA). The governors of the 10 states of the Missouri River Basin established the MBSA in September 1981, "To conduct, encourage and participate in activities which promote interstate coordination of water resources management within the Missouri River Basin." Believing that the MBSA could serve as the forum for the identification, discussion and possible resolution of water issues of concern to the basin states, the 20-member Board of Directors has concentrated staff activities on developing a computerized basin hydrology information system, an interstate floodplain management program, background materials on interstate-interbasin water diversion, state water planning techniques, and historical aspects of the Pick-Sloan Missouri Basin Program. Since the ETSI controversy surfaced, the directors have been working to establish a process that will lead to conflict resolution and ultimately forge a basin states' coalition involving the governors, state legislatures, federal agencies and basin congressional delegation. The development and adoption of this process is a very promising step for resolving our differences in the basin.

The fifth component in the strategy addresses the need to prepare for eventual water allocation proceedings in the Missouri Basin. Montana must get its house in order. We must solidify our claims to existing uses by achieving realistic preliminary decrees in the Missouri and Yellowstone river basins as soon as possible. We must plan and establish future claims to our Missouri River water that will withstand attack by downstream states. We should consider a process not unlike the water reservation process that was implemented in the Yellowstone River Basin. The Yellowstone reservation process provided for a basinwide management plan that took into account available water supply and developed an allocation that provided for consumptive use needs as well as instream flow requirements. Montana should be in a strong position to defend its future needs in the Yellowstone River Basin because of the implementation of the reservation process and because Congress ratified the Yellowstone River Compact, which apportioned the waters of this basin among Montana, Wyoming and North Dakota.

We must also quantify and resolve Indian and federal reserved water rights in Montana. Only through successful negotiations can we complete the statewide adjudication and save Montana, the tribes and the federal government millions of dollars. The other alternative to negotiations is litigation, which is considerably more expensive and does not provide the flexibility needed to resolve differences and improve relations. Negotiations will also provide essential information on water available for future appropriation and development. Many types of costly water projects may not be built until a firm water supply can be assured, whether they are on a reservation, on federal land, or in private ownership. We must also resolve our differences with Wyoming regarding the Yellowstone River Compact and the Little Bighorn Basin. Major water development projects may not occur in the Yellowstone tributaries unless these uncertainties are resolved. By taking these and other actions now, we can develop the strongest possible position for achieving an allocation that protects all current water uses in Montana and provides for our future needs as well.

The final component in the strategy is that of encouraging the wise development and use of our water resources. The best means of claiming a supply of Missouri River water is actually to put the water to beneficial use. However, this is not to say we should rush forward in a mindless drive to seize a share of water before it is committed downstream. Rather, we need to take a careful look at our future consumptive and instream water requirements and proceed with a well-conceived, well-funded water development and management program. In doing so, Montana should support projects and activities that meet our social and environmental goals and, at the same time, assure an adequate water supply for our future needs. To accomplish this component of the strategy, the state may need to evaluate other sources of revenue for water development. The existing water development program created by the 1981 Legislature may not have provided enough funding to replace the unforeseen federal cutbacks in water development and to put the state into a desirable position before compact negotiations begin in the Missouri River Basin. We should evaluate in-state and out-of-state marketing of limited amounts of surplus water from existing and proposed state and federal reservoirs as a means to assist in the financing of future water projects. Other revenue sources should be evaluated, including the development of hydropower on existing state and federal dams. We may even wish to consider using more of the coal severance tax for water development.

In the process of developing this proposed strategy we have found that Montana is in a good position to deal with challenges from the lower Missouri Basin states. Montana is a headwater state where a large portion of the water originates and where it is physically available for meeting our present needs. There also appears to be

ample water to meet our future requirements. Montana can also enjoy the legal protection needed to develop its water because the O'Mahoney-Milliken Amendment gives a preference to consumptive development in the upper basin.

However, regardless of our current strengths, we can ill afford to become complacent. The threat is real, and it seems safe to say that a conflict between the upper and lower basin states is inevitable; in fact, the opening shots have already been fired. Therefore, we must take firm action. Our proposed water protection strategy

must serve as the broad base upon which we build a defense against any challenges to the use of our share of the Missouri River. The rewards of such an endeavor are immense. Failure could result in having to curtail our water development activities because legally superior downstream rights were allowed to become established.

For further information, a summary report entitled "A Water Protection Strategy for Montana in the Missouri River Basin" is available from the Montana Department of Natural Resources and Conservation, 32 South Ewing, Helena, MT 59620.

George William Sherk

RESOLVING INTERSTATE WATER CONFLICTS: THE LITIGATION AND LEGISLATION OPTIONS

Demand for water and conflicts over water are highly interdependent. As demand for water increases throughout the United States, available supplies are being increasingly strained with resulting decreases in both water quantity and water quality. Decisions must be made regarding both location and use of water. In essence, who can use water, for what purpose, where and when must the use occur?

Many water conflicts are interstate conflicts, involving a number of states sharing a common water resource. These interstate conflicts may be resolved through a variety of mechanisms. Interstate stream compacts are one mechanism by which states sharing a water resource have agreed, with the consent of Congress, to a mutual sharing of the resource. It has been suggested that a laissez-faire approach, allowing

the “invisible hand of the marketplace” to dictate uses of shared water resources, should resolve many interstate water conflicts. It has also been suggested that an institution similar to the Federal Mediation and Conciliation Service be established to assist in the resolution of state vs. state and state vs. federal water conflicts.¹

Litigation concerning interstate water conflicts has occurred in a number of different courts. If one state is suing another state(s), the United States Supreme Court has original and exclusive jurisdiction. This is the jurisdictional basis for the equitable apportionment of interstate water resources by the Supreme Court. Equitable apportionment will be discussed in the next section of this analysis.

If a person in one state is suing another state or a person in another state, the United States district courts usually have jurisdiction.² Decisions in these cases, through the appellate process, may ultimately be resolved by the Supreme Court. In cases involving constitutional issues, decisions of state supreme courts are directly appealable to the United States Supreme Court.³ Whether exercising its original or appellate jurisdiction, however, the Supreme Court is a primary actor in the resolution of interstate water conflicts.

Another primary actor is the U.S. Congress which has the constitutional authority to apportion interstate water resources. Congressional resolution of interstate water conflicts will be considered in the third section of this analysis.

EQUITABLE APPORTIONMENT

Background

The United States Constitution, Art. 3, §2, provides that “In all cases. . . in which a State shall be a Party, the Supreme Court shall have original jurisdiction.” In suits between states, the Supreme Court’s jurisdiction is both original and exclusive.⁴

The court has exercised its original jurisdiction several times to resolve interstate water conflicts.⁵ These decisions form the body of federal interstate common law generally known as the doctrine of equitable

apportionment.⁶ It is this doctrine which will be applied by the court to future conflicts between states over shared water resources.⁷ To understand the doctrine, therefore, it is important to understand the case law by which it has been developed.

The case which established the doctrine of equitable apportionment of interstate water resources was *Kansas v. Colorado*.⁸ In this case, Kansas attempted to restrict Colorado’s use of the Arkansas River. The Supreme Court, after acknowledging that economic interests in Kansas might be harmed by Colorado’s use of Arkansas River water, ruled that Colorado was entitled to a share of those waters. The court considered Kansas water law (riparian) and Colorado water law (prior appropriations) and concluded that, when state laws and policies were in conflict, equity would control and the interests of the two states would be balanced. Colorado prevailed, primarily because Kansas was unable to prove to the court that Kansas’ interests

would actually be harmed by diversions in Colorado.

The second equitable apportionment decision, in *Wyoming v. Colorado*,⁹ resulted from an attempt by Wyoming to prevent diversions of Laramie River water by Colorado. In part, the Colorado diversion was to be used in the Laramie-Poudre Tunnel, a transmountain diversion project. Wyoming based its claim on the seniority of Wyoming water rights since both Colorado and Wyoming recognized the doctrine of prior appropriations. Wyoming also argued that the trans-basin diversion should not be allowed since there would be no return flows into the Laramie River.

Both arguments were rejected by the Supreme Court. Trans-basin diversions would be allowed since such uses were allowed under state law. The court refused to apply a strict doctrine of prior appropriation, applying instead a limited priority of appropriations which recognized senior water rights in both states. Once these rights were recognized, the court ruled that there was sufficient flow in the Laramie River for the Laramie-Poudre Tunnel diversion. Colorado was to receive 39,750 ac./ft./yr. with the balance of the dependable flow of the Laramie River (312,250/ac./ft./yr.) going to Wyoming. Presumably, shortages in low-water years were to be borne by Wyoming. This was a "mass allocation" of water to Colorado and Wyoming.¹⁰ The court also imposed a duty on both states to "... exercise her right reasonably and in a manner calculated to conserve the common supply" of water.¹¹

The first equitable apportionment action between two riparian states resulted in the decision in *Connecticut v. Massachusetts*.¹² Connecticut sought to enjoin Massachusetts from new diversions of the Connecticut River for use in the Boston metropolitan area. The court rejected Connecticut's claim because Connecticut was unable to show "real or substantial injury or damage" that would result from the proposed diversion.¹³ The court refused to apply the riparian rights doctrine. Other factors, it seemed "... quite outweighed the common elements of riparian law."¹⁴ The court did restate the "interstate common law" of equitable apportionment:

The determination of the relative rights of contending states in respect of the use of streams flowing through them does not depend upon the same considerations and is not governed by the same rules of law that are applied in such states for the solution of similar questions of private rights. *Kansas v. Colorado*, 185 U.S. 125, 146 ... As was shown in *Kansas v. Colorado*, 206 U.S. 46, 100, such disputes are to be settled on the basis of equality of right. But this is not to say that there must be an equal division of the waters of an interstate stream among the states through which it flows. It means that the principles of right and equity shall be applied having regard to the "equal level or plane on which all the states stand, in point of power and right, under our constitutional system" and that, upon a consideration of the pertinent laws of the contending states and all

other relevant facts, this Court will determine what is an equitable apportionment of the use of such waters. *Wyoming v. Colorado*, 259 U.S. 419, 465, 470.¹⁵

The next equitable apportionment action also involved two riparian states, *New Jersey v. New York*.¹⁶ New Jersey sought to enjoin diversion of the Delaware River to supply water for the city of New York. The court ruled for New York, affirming a determination of the special master appointed for this case that the diversion would not materially affect use of the Delaware River for industrial and agricultural purposes in New Jersey. In essence, New Jersey was unable to show that it would be injured by New York's diversions.

In reaching its decision, the court further restricted the applicability of the riparian rights doctrine to interstate water cases by ruling that lower basin states could not expect upper basin states to provide undiminished streamflows. The court also reaffirmed the principle that diversions need not be restricted to a specific basin. Interestingly, the court required New York to construct sewage treatment facilities before diversions from the Delaware River could commence.¹⁷

The waters of the Tum-a-lum branch of the Walla Walla River were the subject of the next equitable apportionment decision. In *Washington v. Oregon*,¹⁸ Washington sued to prevent Oregon from wrongfully diverting the waters of the Tum-a-lum. Both Oregon and Washington are appropriations doctrine states. Rather than apply the doctrine of prior appropriations, however, the court ruled in favor of Oregon because the hydrologic conditions of the Tum-a-lum in low-water years were such that water would not have reached Washington had Oregon ceased its diversions.

Arizona sought an equitable apportionment of the Colorado River in one of a series of cases entitled *Arizona v. California, et al.*¹⁹ Arizona named all of the Colorado River Basin states as defendants.²⁰ The suit was dismissed, however, because the United States, an indispensable party, had not been joined in the suit. In fact, the United States could not be involuntarily joined in an equitable apportionment suit.²¹

The second case between Colorado and Kansas involving the waters of the Arkansas River was *Colorado v. Kansas*.²² In this case, Colorado sought to enjoin further lawsuits by Kansas water users against Colorado water users. Colorado prevailed in the case because Kansas could not demonstrate that it was being injured by water diversions in Colorado. This burden of proof is "... much greater than that generally required to be borne by private parties."²³

Use of the water of the North Platte River was at issue in *Nebraska v. Wyoming, et al.*,²⁴ an equitable apportionment action involving Nebraska, Wyoming, Colorado (which was impleaded) and the United States (which intervened because of Bureau of Reclamation projects on the North Platte). Nebraska began the action

in 1934 because of fears of the possible adverse impacts of the Kendrick Project on Nebraska water users. All three of the states were prior appropriations doctrine states. The court noted the priority of existing appropriations, but did not strictly apply the prior appropriations doctrine. While the priority of different appropriations may be considered "... the basic principle of equitable apportionment,"²⁵ the court defined a number of factors to be considered in equitably apportioning interstate water resources:

Apportionment calls for the exercise of an informed judgment on a consideration of many factors. Priority of appropriation is the guiding principle. But physical and climate conditions, the consumptive use of water in the several sections of the river, the character and rate of return flows, the extent of established uses, the availability of storage water, the practical effect of wasteful uses on downstream areas, the damage to upstream areas as compared to the benefits to downstream areas if a limitation is imposed on the former—these are all relevant factors. They are merely an illustrative, not an exhaustive catalogue. They indicate the nature of the problem of apportionment and the delicate adjustment of interest which must be made.²⁶

After a consideration of these factors, the court adopted a percentage of streamflow approach suggested by the special master for the case and made a "mass allocation" to the states of Nebraska and Wyoming. The result was "... an en bloc allocation as between the two states, without an adjudication of the rights inter sese [among water rights holders] within each state."²⁷

Equitable apportionment was rejected by the court in the 1963 version of *Arizona v. California, et al.*,²⁸ discussed in the following section, because Congress had provided its own method of allocating the waters of the lower Colorado River when the Boulder Canyon Project Act was enacted in 1928. The court, however, reaffirmed the equitable apportionment doctrine and held that the doctrine would apply in the absence of Congressional action.²⁹

In *Texas v. New Mexico*,³⁰ Texas asked the court to fashion an equitable remedy to resolve a deadlock on the Pecos River Commission. The commission, which was established under the Pecos River Compact, provided equal representation for both states. Texas requested the court to provide for a tie-breaking vote. The court refused, stating that such a fundamental restructuring of the commission would require a change in the Pecos River Compact, which became federal law when it was ratified by Congress. The court could not unilaterally change the compact. If the deadlock remains unresolved, Texas could return to the court for an equitable apportionment of the Pecos River. To succeed, in addition to showing substantial harm or injury, Texas would be required to demonstrate that the compact, as

ratified by both state legislatures and Congress, was so fatally flawed that an allocation of the Pecos River under the compact was impossible and that an equitable apportionment decree was needed.

Colorado v. New Mexico

Against this background, the court was asked by Colorado to equitably apportion the waters of the Vermejo River, an interstate stream originating in the Sangre de Cristo Mountains in southern Colorado and flowing into New Mexico. The Vermejo was fully appropriated by four major appropriators in New Mexico: The Vermejo Park Corporation, Kaiser Steel, Phelps Dodge and the Vermejo Conservancy District, which was the appropriator farthest downstream.

In 1975, Colorado issued a conditional water right to the C. F. & I. Steel Corporation for the diversion of 75 c.f.s. from the Vermejo. New Mexico appropriators asked the U.S. District Court to enjoin any diversions by C. F. & I. on the theory that, under the prior appropriations doctrine, all New Mexico water rights had to be satisfied before any of Colorado's. The District Court issued the injunction on January 16, 1978.³¹ C. F. & I. appealed to the 10th Circuit Court of Appeals, which stayed the action pending resolution by the Supreme Court of *Colorado v. New Mexico*.

The Supreme Court granted Colorado's motion for leave to file a complaint on April 16, 1979, and appointed the Hon. Ewing T. Kerr, Senior Judge of the U.S. District Court in Wyoming, as special master.³² In his report, the special master recommended that Colorado be permitted to divert 4,000 ac./ft./yr. from the Vermejo for a transmountain diversion project. The special master, after reviewing the equitable apportionment case law, rejected a strict application of the prior appropriations doctrine. Rather, he noted that the Vermejo Conservancy District in New Mexico was inefficient and wasted water. He concluded that New Mexico could compensate for a 4,000 ac./ft./yr. diversion in Colorado through water conservation measures and that any injury to New Mexico would be "... more than offset by the benefit to Colorado."³³

New Mexico filed exceptions with the Supreme Court, arguing that the rule of priority should be strictly applied and challenging the special master's conclusion that the benefits to Colorado outweighed the harm to New Mexico. New Mexico also argued that the special master based his recommendation on the belief that Colorado was entitled to a share of Vermejo River water merely because the river originated in the state.

The court ruled on New Mexico's exceptions on December 13, 1982.³⁴ If the special master's recommendation was based on a belief that Colorado was entitled to a share of the Vermejo because the river originated in Colorado, this belief was rejected "... as inconsistent with our emphasis on flexibility in equitable apportionment."³⁵ The rejection by the special master of a strict rule of priority was held to "... comport with the doctrine of equitable apportionment as it has evolved in our prior cases."³⁶

Citing *Kansas v. Colorado* and *Connecticut v. Massachusetts*, the court reaffirmed the doctrine of equitable apportionment as being "... the doctrine of federal common law that governs disputes between states concerning their rights to use the water of an interstate stream."³⁷ Equitable apportionment is a flexible doctrine requiring the consideration of many factors. The factors catalogued in *Nebraska v. Wyoming* were reaffirmed. While state law may be an important consideration, the equitable apportionment of interstate streams "... is a question of federal law that depends 'upon a consideration of the pertinent laws of the contending states and all other relevant facts'." ³⁸ (Citing *Connecticut v. Massachusetts*, emphasis supplied by the court.)

The court rejected New Mexico's argument that priority of appropriations was controlling and concluded that wasteful or inefficient uses would not be protected regardless of their priority. Senior rights neither asserted nor exercised with reasonable diligence would also be unprotected. States, the court said, have "... an affirmative duty to take reasonable steps to conserve and augment the water supply of an interstate stream."³⁹ The court is clearly willing to impose these requirements on existing uses in the states through equitable apportionment decrees. The court will also apply these requirements to new or proposed uses to insure that the quantity of water needed is minimized.⁴⁰ Protection of an existing economy "... will usually be compelling," but not always.⁴¹

With regard to proof in an equitable apportionment action, the court reaffirmed the *Connecticut v. Massachusetts* requirement that a state seeking an equitable apportionment decree must first show "real or substantial injury or damage" by clear and convincing evidence. Once this is done, the burden shifts to the state or states having existing diversions to prove, again by clear and convincing evidence, that the diversion should be continued.⁴²

The court remanded the case to the special master for additional factual determinations in two areas: 1) that the use of 4,000 ac./ft./yr. in Colorado would not materially affect New Mexico because water conservation measures were available, 2) that the benefit to Colorado would outweigh the harm to New Mexico. The court did not feel that it could determine whether the doctrine of equitable apportionment had been properly applied until there was a more complete factual

basis for the special master's recommendations.⁴³

On remand, the special master developed additional findings of fact and reaffirmed his original recommendations. New Mexico once again filed exceptions.

In *Vermejo I*, the court focused on the law of equitable apportionment. In *Vermejo II*,⁴⁴ the focus of the court was on "... the standard by which we judge proof in actions for equitable apportionment."⁴⁵

Colorado's claim to any of the flow of the Vermejo River was to be judged by a clear and convincing evidence standard. This standard is more than a mere preponderance of the evidence. It requires a showing that a state's factual contentions are "highly probable."⁴⁶

Requiring clear and convincing evidence, the court ruled, "... it is necessary to appropriately balance the unique interests involved in water rights disputes between sovereigns."⁴⁷ In applying this standard to the evidence in the record, the court concluded that Colorado had failed to show that New Mexico could compensate for water use in Colorado through reasonable conservation measures or that benefit to Colorado would outweigh harm to New Mexico.⁴⁸

A State can carry its burden of proof in an equitable apportionment action only with specific evidence about how existing uses might be improved, or with clear evidence that a project is far less efficient than most other projects. Mere assertions about the relative efficiencies of competing projects will not do.⁴⁹

"In short," the court ruled, "Colorado's diversion should and will be allowed only if actual inefficiencies in present uses or future benefits from other uses are highly probable."⁵⁰ In reaching this conclusion, the court reaffirmed its holding in *Vermejo I* that the mere fact that the river arises in Colorado does not automatically entitle Colorado to its use.⁵¹ "[T]he equitable apportionment of appropriated rights should turn on the benefits, harms and efficiencies of competing uses, and the source of the Vermejo River's waters should be essentially irrelevant to the adjudication of these sovereigns' competing claims."⁵²

Because Colorado failed to meet its burden of proof, New Mexico's exceptions were sustained. The case was dismissed.⁵³

Doctrine

The doctrine of equitable apportionment appears deceptively simple. States are obligated to share

interstate water resources. If a state's share of an interstate water resource is adversely affected by the actions of another state, the state whose interests have been injured may ask the Supreme Court to equitably apportion the water resource. If Congress has not acted to resolve the conflict, or if the states have been unable to resolve their differences through an interstate compact, the court will apportion the water resource among those states sharing the resource.

A state seeking an equitable apportionment, however, must show that it is actually being harmed by the actions of another state. This harm, as stated in *Connecticut v. Massachusetts*, must be "real or substantial injury or damage."⁵⁴ Because of this, equitable apportionment is basically a "downstream remedy." It would be difficult to imagine a downstream action which would do harm or injury to an upstream state. (The upstream state was the petitioner in *Colorado v. Kansas* and *Colorado v. New Mexico* because of litigation in other courts brought by citizens of Kansas and New Mexico, respectively.)

As stated in *Vermejo II*, injury or damage must be shown by clear and convincing evidence. In essence, it must be highly probable that the facts alleged by the complaining states are true. Once a complaining state has met this burden of proof, the burden shifts to the defending state(s) to prove that the diversions complained of should be allowed to continue. This proof must also be by clear and convincing evidence.

If the complaining state and the responding state(s) meet their respective burdens of proof, the court will be

forced to fashion a decree equitably apportioning the shared water resource ("balancing the equities"). Because each case will focus on a specific set of facts, each decree will be unique.

In fashioning its decree, the court will not follow riparian water law, nor will it be bound by a strict priority of appropriations. Prior appropriations will be a guiding principle, especially in cases involving only prior appropriations doctrine states, but will not be the only consideration.⁵⁵ As stated in *Nebraska v. Wyoming*,⁵⁶ the court will consider all relevant factors including physical and climatic conditions, consumptive use of water in different sections of a stream, the character and rate of return flows, the extent of established uses, the availability of storage water, the practical effect of wasteful uses on downstream areas and the damages to respective states interests if limitations on water use are imposed. Given the court's language in both *Vermejo I* and *Vermejo II*, the extent to which the respective states have conserved and augmented their water supplies will also be considered.⁵⁷ In essence, the court has evolved a doctrine of "equitable priority."

When fashioning its decree, the court may require the states to take such affirmative actions as the treatment of wastewater⁵⁸ or the conservation of water.⁵⁹

One thing is clear, however. Once the court has fashioned its decree, it will generally refrain from any involvement in the administration of water rights under the decree in specific states.⁶⁰ Implementation of the decree will be the responsibility of the states.

LEGISLATION

Another mechanism by which interstate water conflicts may be resolved is through congressional action. Congress clearly has the constitutional authority to apportion the waters of interstate water resources.⁶¹ In *Arizona v. California*,⁶² for example, Arizona sought to enjoin the construction of Hoover Dam as being based on an unconstitutional act of Congress. The court dismissed Arizona's complaint, ruling that the Boulder Canyon Project Act⁶³ was a valid exercise of Congress' constitutional authority over navigable waters.

The Boulder Canyon Project Act also provided the basis for the allocation of the waters of the lower Colorado River among Arizona, California and Nevada. In 1952, Arizona sought an allocation of the

waters to which the lower Colorado River Basin states were entitled under the Colorado River Compact. The Boulder Canyon Project Act authorized the Secretary of the Interior to enter into a number of contracts for use of the waters of Lake Mead (in essence, the entire flow of the mainstream of the lower Colorado River).

In *Arizona v. California, et al.*,⁶⁴ the Court concluded that Congress, by enacting the Boulder Canyon Project Act, "... intended to and did create its own comprehensive scheme for the apportionment among California, Arizona, and Nevada of the Lower Basin's share of the mainstream waters of the Colorado River, leaving each State its tributaries."⁶⁵ This apportionment occurred through the contracts executed by the Secretary

of the Interior for the waters stored in Lake Mead.⁶⁶

At present, there is no legislation pending which would have the effect of apportioning the waters of an interstate water resource between a group of states. Legislation has recently been proposed, however, which could substantially affect interstate water transfers by individual states.

Proposed coal slurry pipeline legislation, specifically S. 267 and H.R. 1010, could have had a substantial impact on the interstate use of water resources. Neither of the bills, however, was enacted. While the language of the bills was somewhat different, the impact of the bills would have been the same. States would have been authorized through the exercise of state water laws to impose otherwise impermissible terms and conditions on the use of water in coal slurry pipelines.

The House Committee on Interior and Insular Affairs favorably reported the "Coal Pipeline Act of 1983" (its version of H.R. 1010) on April 15, 1983.⁶⁷ Section 207 of the bill as reported provided that:

Pursuant to the commerce clause in Article I, section 8 of the United States Constitution, the Congress hereby expressly delegates to the states the power to establish and exercise in state law, whether now in existence or hereafter enacted, terms or conditions (including terms or conditions denying or terminating use) for the reservation, appropriation, use, export, or diversion of or other claim to, or exercise of any right in, water for a coal pipeline, notwithstanding any otherwise impermissible burden which may thereby be imposed on interstate commerce.

This language was identical to the language of the version of H.R. 1010 reported favorably by the House Committee on Public Works and Transportation on June 14, 1983.⁶⁸ (Two subsequent versions of the bill, H.R. 3849 and H.R. 3857, were introduced to reconcile other conflicts in the versions of H.R. 1010 as reported by the two House committees. The "State Water Law" language of the two subsequent bills was identical to that of H.R. 1010.) The legislation was defeated in the House of Representatives on September 27, 1983.⁶⁹

The Senate Committee on Energy and Natural Resources favorably reported S. 267, the "Coal Distribution and Utilization Act of 1983," on April 18, 1983.⁷⁰ Section 5(b) of S. 267 provided that:

In full recognition of its powers under Article I, section 8, of the United States Constitution, Congress expressly delegates to the States the power to regulate the use or export of water in interstate coal pipeline distribution systems, through state water laws, notwithstanding any adverse impact such delegation may have on interstate commerce or on any interstate coal pipeline distribution system. This delegation expressly includes but is not limited to provisions of state water law which provide for the establishment or exercise of terms or conditions (including terms or conditions terminating use or

relating to or prohibiting the export of water) on permits or authorizations for, interests in, or rights to control, reservation, appropriation, purchase, transfer, use, diversion, dedication, disposal, distribution, acquisition, exercise, export or claim of water for the export or use in any interstate coal pipeline distribution system.

It is clear from the committee reports on the three bills that the committees intended to expressly and affirmatively create a use-specific reversal of the decision of the Supreme Court in *Sporhase v. Nebraska*.⁷¹ The committees repeatedly stressed the primacy of state water law over any national interest in the construction of coal slurry pipelines.⁷² The committees were insistent on this point. There is no question but that the committees intended to avoid a situation where any subsequent court could overrule state water laws by virtue of a perceived national purpose underlying the legislation.⁷³

Other recently introduced bills would also affect interstate water transfers. Representative Regula introduced H.R. 1207 on February 2, 1983. It appears that the intent of the bill was to reverse the *Sporhase* decision in its entirety. In relevant part, the bill provides that:

Sec. 2. The regulation of the interstate transfer of water shall be subject to the laws of the several states which relate to the regulation of the interstate transfer of water.

Sec. 3. No Act of Congress pursuant to the commerce clause of the United States Constitution shall be construed to invalidate, impair, or supersede any law enacted by any state for the purposes of regulating the interstate transfer of water.

The bill was sent to the Water and Power Resources Subcommittee of the House Committee on Interior and Insular Affairs and to the Water Resources Subcommittee of the House Committee on Public Works and Transportation. There has been no further action on the bill.⁷⁴ (*Ed. Note: H.R. 1207 died in committee.*)

Legislation has also been introduced which would prohibit a state from diverting water outside of a river basin or aquifer shared by two or more states unless the states sharing the resource agreed to the diversion. This legislation, H.R. 1749, was introduced on March 1, 1983, by Representative Bedell (and fourteen other Representatives.) Section 2 of the bill provides that:

No state shall sell or otherwise transfer or permit the sale or transfer, for use outside of such State, water which is taken from any river or other body or surface water which is located in or which passes through more than one State or from any aquifer or other body of groundwater which underlies more than one State unless—

(1) there is in effect an interstate compact (A) among the states under which such aquifer or other body of groundwater lies,

which governs such sale or transfer, and
(2) all the states which are parties to such compact consent to such sale or transfer.

The bill was referred to three committees. The House Agriculture Committee (Conservation, Credit, and Rural Development Subcommittee) held hearings on June 15, 1983. The bill was also referred to the House Interior Committee (Water and Power Resources Subcommittee) and the House Public Works Committee (Water Resources Subcommittee). (*Ed. Note: H.R. 1749 died in committee.*)

The language of this bill was originally proposed, and rejected, as an amendment to H.R. 1010, the coal slurry pipeline legislation. The proposed amendment was rejected by the House Committee on Interior and Insular Affairs for two reasons. First, it would not have allowed for the voluntary development of interstate compacts. Second, it could have resulted in a state veto by allowing one state of a shared basin or aquifer to frustrate the efforts of another state to transfer water.⁷⁵ The proposed amendment was also considered and rejected by the House Committee on Public Works and Transportation.⁷⁶

Legislation similar to H.R. 1749 has been introduced to restrict any diversion of Great Lakes water without the unanimous consent of the Great Lakes States. Senator Percy introduced S. 2026, the "Great Lakes Water Diversion Act" on October 28, 1983. In relevant part, the bill provides that:

Sec. 4. Great Lakes water shall not be diverted, either directly or through diversion of tributary flows, for use outside of a Great Lakes State unless such diversion is approved by all eight Great Lakes States and the International Joint Commission.

The bill was referred to the Senate Committee on Environment and Public Works. (*Ed. Note: S. 2026 died in committee.*)

The companion House bill, H.R. 4545, was introduced on November 8, 1983, by Representative Oberstar. H.R. 4545, the "Great Lakes Protection Act," provides that:

Sec. 2. (a) No Great Lakes State shall sell or otherwise transfer or permit the sale or transfer, for use outside of such state, water which is taken from any of the Great Lakes or any other body of surface or ground water which is located within the Great Lakes drainage basin unless—

(1) there is in effect an interstate compact among the Great Lakes States which governs such sale or transfer, or

(2) each of the Great Lakes States consents to such sale or transfer.

The bill was referred to the House Committee on Public Works and Transportation. (*Ed. Note: H.R. 4545 died in committee.*)

Interestingly, both S. 2026 and H.R. 4545 would prohibit the expenditure of "any Federal funds" to study the feasibility of diverting the waters of the Great Lakes. The only exception to this general prohibition, contained in both S. 2026 and H.R. 4545, would be for studies conducted "... under the direction of the International Joint Commission in accordance with the Boundary Waters Treaty of 1909."

An alternative approach which has been proposed would be for Congress to provide legislative guidance to the Supreme Court regarding the court's consideration of equitable apportionment litigation.⁷⁷ This approach may be impractical, however, because of the unique nature of each equitable apportionment action. This exists, it is argued, because:

Interstate disputes over water are relatively few but of tremendous importance. Solutions for these problems are likely to be ad hoc solutions shaped to the particular stream, the particular development on that stream either achieved or hoped for, and the particular competing objectives giving rise to the controversy.⁷⁸

CONCLUSION

There is no single mechanism by which all interstate water conflicts might be resolved. The appropriate resolution mechanism is a function of the factual and legal issues underlying a specific dispute.

Nor are dispute resolution mechanisms mutually exclusive. They are, in fact, extensively interdependent. Litigation has been required to interpret acts of Congress (*Arizona v. California, et al.*) and interstate

stream compacts (*Texas v. New Mexico*). If a mediation function is established to resolve interstate water conflicts, lines of appeal to the appropriate court must also be established.

All possible dispute resolution mechanisms have

strengths and weaknesses. Hopefully, those involved in the resolution of interstate water conflicts will select a mechanism because of its strengths rather than forcing the use of a mechanism because of its weaknesses.

FOOTNOTES

1. A modest proposal is contained in Sherk, "Resolving Water Conflicts: A Potential Alternative," paper presented at a Conference on **Water for the 21st Century: Will it be there?** at Southern Methodist University, Dallas, Texas, April 3-5, 1984.
2. There are numerous examples of interstate water conflicts being addressed in U.S. District Courts. For example, *Intake Water Company v. Yellowstone River Compact Commission*, Civil No. 1184 (D.Mt. Filed Oct. 11, 1983) (Yellowstone River Compact exempt from challenge under the commerce clause of the U.S. Constitution since the Compact, once ratified by Congress, became Federal law; decision is currently on appeal); *Yellowstone River Pipeline Company v. Montana Department of Natural Resources and Conservation*, Civil No. C-82-0473 (D.Mt.) (pending challenge, in part, to the constitutionality of the Yellowstone River Compact); *City of El Paso v. Reynolds*, 563 F. Supp. 379 (D.N.M. 1983), vacated and remanded, — F.2d— (10th Cir. Dec. 16, 1983) (New Mexico's statutory restrictions on the export of water were an impermissible burden on interstate commerce; vacated by the 10th Circuit Court of Appeals and remanded to the District Court for "fresh considerations" in light of newly enacted legislation in New Mexico). It has been argued that the *El Paso* case should have been considered by the Supreme Court as a conflict between two States (instead of being considered by the District Court because of the diversity of citizenship of the parties) and should have been based on the doctrine of equitable apportionment (instead of the New Mexico statute being subject to commerce clause scrutiny). Utton, "The *El Paso* Case: Reconciling *Sporhase* and *Vermejo*," 23 *Natural Resources Journal* IX (1983).
3. The best example is *Sporhase v. Nebraska*, — U.S. —, 102 S. Ct. 3456 (1982), which was the appeal of a decision of the Nebraska Supreme Court. On July 2, 1982, the

- U.S. Supreme Court ruled that water was an article of interstate commerce, that Nebraska's reciprocity requirement for water exports violated Art. I, §8 (the commerce clause) of the U.S. Constitution and that Congress had not authorized the States to impose such otherwise impermissible burdens on interstate commerce.
4. 28 U.S.C. §1251 (a)(1984) provides that "The Supreme Court shall have original and exclusive jurisdiction of all controversies between two or more States."
 5. A discussion of the various roles the Supreme Court plays in fashioning an equitable apportionment decree in a specific case can be found in C. Corker, "Water Rights in Interstate Streams" in **Water and Water Rights** 328 (R.E. Clark, ed. 1967) (hereinafter cited as Clark).
 6. H. Ellis and J. DeBraal, "Interstate Dimensions of Water Rights," in **Water Rights Laws in the Nineteen Western States** 66 (W. Hutchins ed. 1977) (hereinafter cited as Hutchins) and F. Trelease, **Water Law** 642 (3rd. ed. 1979) (hereinafter cited as Trelease).
 7. Since each equitable apportionment action is based on a unique set of facts, application of the doctrine will vary on a case-by-case basis.
 8. 206 U.S. 46 (1907). Clark, *supra* note 5 at 32, 349; Hutchins, *supra* note 6 at 67; Trelease, *supra* note 6 at 642. See also Report of Special Master on the Equitable Apportionment of the Vermejo River at 9, *Colorado v. New Mexico*, 459 U.S. 176 (1982) (hereinafter cited as Special Master).
 9. 259 U.S. 419 (1922). Clark, *supra* note 5 at 331; Hutchins, *supra* note 6 at 69, n.15; Trelease, *supra* note 6 at 646; Special Master, *supra* note 8 at 10.
 10. The decree was amended in 1936 (298 U.S. 573), 1940 (309 U.S. 572) and 1957 (353 U.S. 953). Total Colorado diversions were ultimately increased to 19,875 ac./ft./yr. for out-of-basin uses and 29,500 ac./ft./yr. for uses within the Laramie River watershed. Clark, *supra* note 5 at 334; Trelease, *supra* note 6 at 649.
 11. 259 U.S. at 484.
 12. 282 U.S. 660 (1931). Clark, *supra* note 5 at 348; Trelease, *supra* note 6 at 664; Special Master, *supra* note 8 at 13.
 13. 282 U.S. at 670.
 14. Clark, *supra* note 5 at 348-349. The Courts language is illustrative: "The laws in respect of riparian rights that happen to be effective for the time being in both States do not necessarily constitute a dependable guide or just basis for the decision of controversies such as are here presented." 282 U.S. at 670.
 15. 282 U.S. at 670.
 16. 283 U.S. 336 (1931). Clark, *supra* note 5 at 349; Hutchins, *supra* note 6 at 72; Trelease, *supra* note 6 at 650; Special Master, *supra* note 8 at 15.
 17. New Jersey had presented a "dilution is the solution to pollution" argument to justify its claims to Delaware River water. An alternative, which the Court adopted, was to require New York to construct sewage treatment facilities.
 18. 297 U.S. 517 (1936). Special Master, *supra* note 8 at 15. The Special Master's comment about interstate water conflicts should also be noted: "Unfortunately, simplicity is never the rule in cases between two States, and the current matter is no exception." *Id.*
 19. 298 U.S. 558 (1936). Trelease *supra* note 6 at 664.
 20. California, Colorado, Nevada, New Mexico, Utah and Wyoming.
 21. Certain exceptions now exist under the Colorado River Storage Project Act. 43 U.S.C. §620m (1964). Trelease, *supra* note 6 at 665. In drafting new interstate compacts, it might be advisable to include language subjecting the United States to involuntary joinder in litigation to interpret the compact.
 22. 320 U.S. 383 (1943). Trelease, *supra* note 6 at 645; Special Master, *supra* note 8 at 18.
 23. 320 U.S. at 393.
 24. 325 U.S. 589 (1945). Clark, *supra* note 5 at 346; Hutchins, *supra* note 6 at 69, n. 15 and 70-71; Trelease, *supra* note 6 at 654; Special Master, *supra* note 8 at 19.
 25. Special Master, *supra* note 8 at 21.
 26. 325 U.S. at 618.
 27. Clark, *supra* note 5 at 334. Existing uses in Colorado were recognized and protected. The flow of the North Platte was then divided between Wyoming and Nebraska on a percentage basis.
 28. 373 U.S. 546 (1963).
 29. This position was restated in *Arizona v. California et al.*, — U.S. —, 103 S. Ct. 1382 (1983) in which the Court explained its 1963 ruling: "We agreed with the Special Master that the allocation of Colorado River water was to be governed by the standards set forth in the [Boulder Canyon] Project Act rather than by the principles of equitable apportionment which in the absence of statutory directive this Court has applied to disputes between States over entitlement to water from interstate streams." 103 S. Ct. at 1386.
 30. — U.S. —, 103 S. Ct. 2558 (1983).
 31. *Kaiser Steel Corporation, et al. v. C. F. & I. Steel Corporation*, Civil No. 76-244 (D.N.M. 1978)
 32. Report of Special Master on the Equitable Apportionment of the Vermejo River, *supra* note 8.
 33. *Id.* at 23.
 34. *Colorado v. New Mexico*, 459 U.S. 176 (1982) (hereinafter cited as *Vermejo I*).
 35. 459 U.S. at 181, n. 8.
 36. 459 U.S. at 182.
 37. 459 U.S. at 183.
 38. 459 U.S. at 184.
 39. 459 U.S. at 185.
 40. 459 U.S. at 186.
 41. 459 U.S. at 187.
 42. 459 U.S. at 187, n. 13. The procedural aspects of equitable apportionment actions are discussed in Clark, *supra* note 5 at 352.
 43. 459 U.S. at 183. In a concurring opinion, Justices O'Connor and Powell, citing *Wyoming v. Colorado*, stressed that any water conservation measures applied to the Vermejo Conservancy District must be "financially and physically feasible." 459 U.S. at 193.
 44. *Colorado v. New Mexico*, — U.S. —, No. 80, Original (filed June 4, 1984) (hereinafter cited as *Vermejo II*.)
 45. *Id.*, slip op. at 4.
 46. *Id.*, slip op. at 5.
 47. *Id.*
 48. *Id.* slip op. at 8. Colorado also failed to prove that it had taken steps to minimize the amount of water to be used in Colorado. This was required by *Vermejo I*, 459 U.S. at 186.
 49. *Id.*, slip op. at 9.
 50. *Id.*, slip op. at 6.
 51. 459 U.S. at 181, n. 8

52. *Vermejo II*, *supra* note 44, slip op. at 12.
53. Justice Stevens dissented, arguing that Colorado had, in fact, met its burden of proof and that the findings of the Special Master should be respected by the Court. Justice Stevens was critical of New Mexico for failing to take affirmative steps to eliminate the waste of water. In his opinion, New Mexico was wasting water, Colorado had proved that to the Special Master by clear and convincing evidence, the Special Master had so ruled and the Court should have affirmed the recommendations of the Special Master. *Id.*, Dissent of Justice Stevens.
54. This requirement was reaffirmed in *Vermejo I*, 459 U.S. at 187, n. 13. The Supreme Court will not exercise its jurisdiction unless the harm is of "serious magnitude." *Hinderlider v. La Plata County*, 304 U.S. 92 (1968). Hutchins, *supra* note 6 at 68.
55. Clark, *supra* note 5 at 331; Hutchins, *supra* note 6 at 71. Priority has been the basis for all of the Courts decisions involving prior appropriations doctrine States except for *Washington v. Oregon* where hydrologic conditions made its use impractical.
56. Reaffirmed in *Vermejo II*, *supra* note 44, slip op. at 6.
57. In *Vermejo II*, for example, the Court disagreed with the Special Master over the issue of water conservation: "[W]e cannot agree that Colorado has met its burden of identifying, by clear and convincing evidence, conservation efforts that would preserve any of the Vermejo River water supply?" *Supra* note 44, slip op. at 8.
58. As was done in *New Jersey v. New York*.
59. Justice Douglas, in his dissent in *Arizona v. California*, *et al.* 373 U.S. at 627, argued that two additional factors should be considered: 1) the percentage of the area of a shared water resource falling within a specific State and 2) the extent of out-of-basin diversions by a specific State. Neither of these factors has yet to be adopted by the Court.
60. Hutchins, *supra* note 6 at 71.
61. Clark, *supra* note 5 at 364; Hutchins, *supra* note 6 at 103; Trelease, *supra* note 6 at 672.
62. 283 U.S. 423 (1931). Also Clark, *supra* note 5 at 365.
63. 43 U.S.C. §§617-617t (1964, Supp. 1984).
64. 373 U.S. 546 (1963). Clark, *supra* note 5 at 366; Trelease, *supra* note 6 at 672; Special Master, *supra* note 8 at 21.
65. 373 U.S. at 564. This decision was restated in 1983 in *Arizona v. California*, *et al.*, 103 S. Ct. 1382. The Court again noted that the Boulder Canyon Project Act was a "... comprehensive scheme for the apportionment among California, Nevada and Arizona of the Lower Basin's share of the mainstream waters of the Colorado River, leaving each State its tributaries." 103 S. Ct. at 1386. See note 29.
66. Clark, *supra* note 5 at 366, concludes that the Court's decision illustrates three propositions: 1) that Congress can allocate the waters of interstate streams, 2) that Congress can delegate this authority to an executive official (here the Secretary of the Interior) and 3) that Congress did both in the Boulder Canyon Project Act.
67. H.R. Rep. No. 98-64, Part 1, 98th Cong., 1st Sess. (1983).
68. H.R. Rep. No. 98-64, Part 2, 98th Cong., 1st Sess. (1983).
69. Pursuant to rule, the text of H.R. 3857 was substituted for the text H.R. 1010 and was presented to the House of Representatives. The proposed legislation was defeated by a vote of 235 to 182 (with 16 abstentions.)
70. S. Rep. No. 98-61, 98th Cong., 1st Sess. (1983).
71. — U.S. —, 102 S. Ct. 3456 (1982). See note 3.
72. H.R. Rep. No. 98-64, Part 1, *supra* note 67 at 15, 19; H.R. Rep. No. 98-64, Part 2, *supra* note 68 at 5-8, 26-27; S. Rep. No. 98-61, *supra* note 70 at 12, 14, 17-18, 20-25, 31-32.
73. This had occurred in *First Iowa Hydro-Electric Cooperative v. FPC*, 328 U.S. 152, (1946) and it is what the committees wished to avoid. H.R. Rep. No. 98-64, Part 1, *supra* note 67 at 22; H.R. Rep. No. 98-64, Part 2, *supra* note 68 at 8; S. Rep. No. 98-61, *supra* note 70 at 20, 23.
74. It questionable whether the bill, if enacted, would reverse the *Sporhase* decision since *Sporhase* was based on the Commerce Clause of the Constitution, not on an Act of Congress passed "pursuant to the commerce clause."
75. H.R. Rep. No. 98-64, Part 1, *supra* note 67 at 21-22.
76. H.R. Rep. No. 98-64, Part 2, *supra* note 68 at 105-108.
77. Clark, *supra* note 5 at 326.
78. *Id.*

Gary Weatherford

SOME MUSINGS ABOUT A COMPACT FOR THE MISSOURI RIVER BASIN

Compact Consciousness

Each river basin is a bioregional province with its own unique features, culture, and political personality. Outsiders can easily overlook a basin's low relief and misread its more dramatic contours. (I say this with conviction, having once gotten lost and rimmed-out high in the headwaters of this basin—in the Absaroka wilderness.) As an outsider invited into your basin province, I hope to observe more than advise.

Whenever states quarrel over common waters, talk turns variously to litigation, legislation and negotiation. An interstate compact requires both legislation and negotiation; litigation is optional.

Compact consciousness is evident in the Missouri River Basin. The lower federal court ruling in the ETSI case,¹ blocking the out-of-basin diversion of water from Lake Oahe in South Dakota, recently prompted Iowa's governor to call for a negotiated compromise and its attorney general to suggest a compact.² The lower basin

states of Nebraska, Iowa, Kansas, and Missouri have been circulating a draft barge traffic compact.³ Representative Young (Missouri) is sponsoring a bill in Congress that would consent to the negotiation of a compact by the basin states.⁴ Such selective soundings, of course, say nothing about the advisability, possible scope, or likelihood of a compact apportioning the interstate waters of the Missouri River Basin. I am sure that conventional wisdom (perhaps even Jimmy the Greek) would say that there are double-digit odds against getting the 10 (or even the seven) more affected states of this basin to agree upon such a compact. One of the gratifying trends in water resources, however, is that people are no longer leaving the field to experts. Groundswells of public opinion can make the improbable happen. At the very least, the subject of compacts is and will remain a policy option that leaders must remain open to and, as such, it deserves serious scrutiny.

Montana's own compact experience includes, of course, the extant Yellowstone River Compact of 1951 with North Dakota and Wyoming (65 Stat. 663), participation in the ill-fated negotiation of a Columbia River Basin compact (1954-1968), and the circulation of a draft Missouri River Basin Compact in 1952-53 (prepared for the Missouri River States Committee by the Council of State Governments).⁵

Compact Elements

A compact is a formal agreement approved by the participating states and Congress.⁶ There is some question whether prior Congressional consent is necessary for interstate compact negotiations, but it traditionally has been sought in addition to ratification of the final negotiated document.⁷ The compact clause of the Constitution has been interpreted as “affording Congress a veto over those interstate agreements which might be prejudicial to broader national interest.”⁸

Interstate coordination and cooperation can occur, with federal blessing, outside the framework of a compact, of course, as the river basin planning commissions on the Missouri and other major waterways (under the Water Resources Planning Act of 1965) once showed and the Missouri Basin States Association now shows. Federally chartered water corporations, patterned after the Tennessee Valley Authority or even the Communications Satellite Corporation, could operate without a compact.⁹ Also, in a practical sense, apportionment of interstate waters can occur incrementally with interstate support through the authorization, construction and operation of federal water projects, such as those projected for your basin in the Pick-Sloan Plan and the Flood Control Act of 1944.¹⁰ And, under conditions of plenty, the use and management of interstate water can proceed with a tacit recognition of other states’ interests, without the formal quantification of water rights. As water demands and water-related environmental impacts increase, however, expectations tend to become dashed and fears mount, eroding tacit forms of water coexistence and prompting

The Need for Compacts

The need to quantify water shares is illustrated by more than 20 interstate water apportionment compacts in the western United States.¹¹ Water compacts differ in their scope, structure and relative achievements. They have dealt variously with boundary, navigation, fishing rights, water apportionment, pollution, water planning and flood control problems.¹² Some simply declare policies or rights; others establish on-going administrative compact commissions, made up of state representatives (with authority); while a few (e.g., Delaware and Susquehanna)—dubbed “federal-interstate” compacts—create agencies jointly composed of federal and state representatives. The Delaware River Basin Compact (1961) and its “progeny,” the Susquehanna River compact (1970), are elaborate and comprehensive, and had been often cited in the past as the most advanced water compacts in conception and design. The Delaware and Susquehanna compact commissions have developed comprehensive plans and policies and water quality programs, licensed projects, adopted drought measures, and promoted flood control.¹³ Devisiveness and the waning support of New York, a headwater state in both compacts, has caused those two compact models to lose some of their luster.¹⁴

In general, interstate water compacts, while imperfect mechanisms, tend to be rated as worthwhile and moderately effective when compared to alternative means of approaching regional water problems.¹⁵

COLORADO COMPACT EXPERIENCE

The focus of this paper is on the Colorado River Basin and what its compact experience might teach others. There is some logic in looking at the Colorado River system. First, it contributes some of its scarce waters to your Missouri River Basin through imports by Colorado and Wyoming into the North and South Platte. Second,

its political complexity (involving seven states, more than 19 Indian Reservations and Mexico) rivals your own (with 10 states, multiple Indian reservations and Canada involved). Third, its water supply-demand history has precipitated decades of formal combat and cooperation that may be instructive.

The Colorado River system is affected by two compacts: the basinwide seven-state 1922 Colorado River Compact, and the five-state 1948 Upper Colorado River Basin Compact.¹⁷

The 1922 basinwide compact broke new ground for interstate compacting. Prior compacts typically involved only two states and dealt with state boundary disputes.¹⁸ The 1922 compact (which became effective as a six-state accord in 1928 and was finally approved by holdout Arizona in 1944) divided the consumptive use of the Colorado River's flow between upper and lower parts of the basin, muting upriver fears about preemptive downstream appropriations and facilitating federally subsidized water and power development for Southern California. Several forces combined to produce the compact. The highly irrigable Imperial Valley was lobbying mightily for a federal dam on the river to provide storage, flood control and silt reduction, and for a diversion canal located entirely north of the U.S.-Mexico border. Los Angeles, competing with private power interests, became intent on obtaining electric power from the envisioned dam and reservoir at Boulder Canyon. The federal Reclamation Service's desire to construct a high dam to promote irrigation in the lower reaches of the basin became embodied in a formal report and legislative proposal in 1922. Pending in the U.S. Supreme Court at the time was the *Wyoming v. Colorado* lawsuit over the Laramie River¹⁹ which held out the prospect (later in June 1922, the reality) that the high court would recognize the prior appropriation doctrine in interstate water disputes, giving the earlier in time (senior) appropriator preference over the later (junior) one. Fast-paced water development in Southern California could thus have given that area senior rights over the planned and potential uses upstream.

All of these forces and prospects made the upstream states, which expected to develop more slowly, legitimately nervous. Led by Colorado, those states came to see the need for a compact-guaranteed allotment or reservation of sizable shares of the river's flow for themselves. So there was a rising mutuality of interest and sense of urgency—Southern California needed a recognized right to water to make any federal water project investment feasible, and the upper basin states needed a protected share of the flow. Commissioners representing the seven basin states, joined by President Harding's representative, Herbert Hoover, began negotiating the compact in January of 1922 and, after long days of argument, approved their compact document in November of the same year. Agreement could not be reached on water entitlements for each state; instead the compact divides water between a lower basin and an upper basin (the boundary lines run through a point, called Lees Ferry, about 10 miles downstream from where the Glen Canyon Dam now sits).

The 1922 compact, while declaring that each of those sub-basins was apportioned perpetually "the exclusive

beneficial consumptive use of 7,500,000 acre-feet of water per annum, provides that the upper states will not cause the flow of the river at Lees Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years. . . ."²⁰ Practically speaking, this guaranteed minimum delivery requirement means the upper states bear the risk of shortage. The flow records on which this apportionment was based were for a limited period that we now know was abnormally high. Instead of the 16.4 million acre-feet per annum average flow that the negotiators assumed for the river at Lees Ferry, current estimates range from about 13.5 to 14.8, leaving the upper states with considerably less potential supply than the 7.5 million acre-feet proclaimed for them.²¹

The 1922 compact did many more things than create an upper and lower basin apportionment formula. It anticipated a water treaty by specifying how water for Mexico would be charged against the system. It made electric power generation subordinate to agricultural and domestic uses. It deferred the question of Indian water rights with the now famous (or infamous) disclaimer: "Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes," language later used in the Upper Colorado River Compact (and approximated in your own Yellowstone River Compact). The 1922 compact did not create an administrative mechanism such as a commission, although it did mandate interstate and federal-state cooperation.

Since the 1922 compact did not apportion water to each state, there remained that task. The Boulder Canyon Project Act of 1928, over Arizona's objections, authorized the construction of Boulder Canyon (now Hoover) Dam and the All-American Canal for Imperial and Coachella valleys, allowed the approval of the 1922 compact as a six-state agreement, and consented to another possible compact that would apportion annually 0.3 million acre-feet to Nevada, 4.4 million acre-feet and half the surplus to California, and 2.8 million acre-feet plus half the surplus to Arizona. That latter tri-state compact was never negotiated, although the apportionment it suggested became a reality when the U.S. Supreme Court in the fourth *Arizona v. California* case concluded in 1963 that Congress had delegated the power to the Secretary of the Interior to apportion water to those states by contract.²²

Mexico was recognized a right to 1.5 million acre-feet per annum in the international treaty of 1944.²³ Then the upper basin states, desiring more federally subsidized water projects for their region, realized that water rights had to precede development²⁴ and negotiated their own compact (essentially during three weeks) in 1948. The resulting Upper Colorado River Basin Compact, unlike its 1922 relative, did apportion water to individual states and did authorize a compact commission.²⁵ Wisely, given the uncertainty as to the amount of firm water available to it under the 1922

compact and climatic variability, the upper basin arrived at a percentage formula of apportionment: 11.25 percent for New Mexico, 14 percent for Wyoming, 23 percent for Utah, and 51.75 percent for Colorado.²⁶ The interests of the four states are centered in the Upper Colorado River Commission, composed of a representative from each state and the United States, and located in Salt Lake City. The 1948 compact prepared the way for the Colorado River Storage Project Act of 1956, which authorized Glen Canyon Dam and a host of other upper basin projects.

The apportionment of water to Indian tribes in the Colorado River basin, an issue side-stepped by the 1922 and 1948 compacts, is only partially complete. Five lower Colorado River tribes were awarded reserved water rights in the latest *Arizona v. California* decision, those apportionments being chargeable against the entitlements of the states in which the reservations are located.²⁷ Other reservations have been variously litigating, negotiating or delaying quantification of their claims.²⁸

Another issue not addressed by the compact, water

quality, became an international *cause celebre* in the early 1960s when highly saline return flows in the Wellton-Mohawk irrigation district in Arizona imperiled crops in Mexico's Mexicali Valley. Negotiations led finally to an accord tying the quality of the water delivered to Mexico to the quality of water at the Imperial Dam on the U.S. side.²⁹ Congress passed the Colorado River Basin Salinity Control Act of 1975 (PL 93-320) to provide controls on natural and man-made sources of salt. The salt control program is overseen by an interstate Colorado River Salinity Control Forum which symbolizes a united commitment by the seven states to make salt control a continuing federal responsibility.

Groundwater in the basin, another subject omitted in the 1922 and 1948 compacts, is subject to state-by-state regulation. The federal government has stopped some people from pumping underflow near the mainstem in the lower stretch of the river, thereby protecting the surface waters of the "system" covered by the compacts. Otherwise, groundwater has remained outside the reach of the compacts.

COLORADO COMPACT LESSONS

Several observations can be drawn from the water compact experience on the Colorado and other rivers.

States must be highly motivated. It normally takes a formidable treat and/or threat to bring a state to a compact negotiation table. (The prospect of large-scale, federally subsidized water development and the fear of preemptive water appropriations within rival states combined to motivate the Colorado River Basin states.) Many conditions must coincide to motivate all interested states to negotiate. Typically, the status quo favors one or more states. Why would such a state ever want to change the status quo? One possible answer: it may face being dragged involuntarily into the U.S. Supreme Court or Congress where its advantage could be diluted or destroyed. It might be better for such a state to use its advantage in such negotiations than to risk confrontations in which it has relatively less control or influence.

The basic point is this: it takes a coincidence of events and conditions to put a group of states in the frame of mind necessary to negotiate a compact. The participating states must have a strong sense, variously, of urgency, uncertainty or potential advantage.

Compacts do not solve everything. Water compacts differ in their scope. Even where the scope of the negotiations is agreed upon at the outset, rarely can the negotiating parties reach consensus on all points. Typically the negotiators reach rough agreement on some points, and agree to disagree on others. Generally, in fact, some of the express terms of agreement are purposefully left ambiguous and their refinement deferred due to lack of agreement. The possible water rights of Mexico and Indians were ambiguously alluded to in the Colorado River compacts; no reference was made in those documents to salinity, groundwater, evaporation and seepage losses, fish and wildlife protection or interstate water marketing and trading.

One question a participating state should ask, then, given the fact that compacts do not solve all problems for all time, is: Will the formal framework and relations defined by a compact make it easier or harder to resolve remaining conflict?

Assumptions and risks lurk in compacts. Assumptions about water supply and demand—past, present and future—underlie any interstate division of water. And assumptions can prove to be wrong. Disturbing but all-too-real drought, demographic or political

conditions can prove earlier projections wrong. Who will bear the risk of error or change? As already noted, the lower basin of the Colorado shrewdly hedged its bet by requiring a minimum delivery of water from the upper basin. In addition, California obtained Congressional assurance in 1968 that prior uses will take precedence over the Central Arizona Project in the event of shortage.¹⁰

States entering compact negotiations should make a deliberate effort to identify and assess improbable events and related risks.

Compact boundaries are not self-evident. Although river basins may seem to be logical units for water allocation and planning, states negotiating compacts do not have to extend or limit the reach of their agreement to a basin. The 1922 Colorado River Compact purported to cover the river "system," including all tributaries, but the U.S. Supreme Court has allowed Arizona to use its tributaries (e.g., the Gila River) without that use being charged against Arizona's entitlement in the Colorado "system."¹¹

The issue of spatial coverage would be most interesting in the Missouri River Basin setting. The

Missouri contributes water and sediment to the Mississippi. Would the lower Mississippi states be formally represented in compact negotiations? Would all the surface waters draining the Missouri Basin be covered? What about riverine or non-riverine groundwater?

The identification of the water subject to a compact, in short, is an important and negotiable matter.

Compact negotiations take time. Compact negotiations are normally prolonged. The Colorado Basin compacts were negotiated comparatively quickly, within months. Typically a water compact takes years to hammer out. Such delay must be compared to litigation and legislation, which commonly are also drawn out. Arizona has sued California over the Colorado River four times since 1932; the latest suit was filed in 1952 and finally appears to be winding down. Major water legislation has almost always taken years to get through Congress. Now it is difficult to get Congress to focus on anything other than the federal budget, meaning that longer, not shorter, delays in legislative action can be expected. All methods of formally reducing interstate conflict over water consume time.

COMPACT QUERIES FOR MONTANA

How Compelling is the Status Quo?

Headwater states, by definition, have a physical advantage. Unless constrained or restrained, they can withhold water from downstream states. As you know all too well, Montana and its sister Missouri Basin states west of the 98th Meridian have another advantage given them by the O'Mahoney-Milliken Amendment of the 1944 Flood Control Act; their consumptive uses come first over the navigation uses on the Missouri River.¹² That is an important part of the status quo.

The consumptive use preference is subject to judicial interpretation, however. One of the key issues pending in the *Andrews* case is whether transbasin interstate diversions qualify as preferred consumptive uses. If not, one of the major markets for your water could fall outside of the preference clause. Is it possible, under such circumstances, that Montana might see advantage in an interstate effort to obtain Congressional approval of a basinwide apportionment formula that, for example, might sanction a degree of both state protectionism and interstate export for Missouri River Basin water?

The compact negotiation and ratification process entails compromise and Congressional review.

Presumably the O'Mahoney-Milliken consumptive use preference would be a subject the downstream barge traffic states would want discussed in any negotiations or legislative deliberations.

There is an important rule of interstate rivers that operates to reduce the leverage that an upstream state like Montana otherwise might possess. The U.S. Supreme Court does not normally enjoin downstream states from using water that upstream states do not presently need. This means a downstream state can end up using more than the entitlement it has been apportioned by a compact, statute or court. (California users have been enjoying, quite lawfully, an aggregate annual use that is more than 700,000 acre-feet over the state's 4.4 million acre-feet base entitlement in the Colorado River.) This also means that downstream states have an incentive not to support the development of upstream consumptive use. Traditionally, if an upstream state needed federal funding for its water development, it would find its neighbors downstream opposing the idea—unless a bargain had been struck, as

in the form of a “comprehensive” set of projects that provide benefits for both the upstream and downstream states. Given the bleak forecasts for new, heavily subsidized federal water development, the old dynamic of “distributive” (aka pork barrel) politics may become less of a factor in regional water allocation. Still, if Montana needs anything out of Congress in the future that downstream states have the votes to thwart, the potential exists, does it not, for reopening the consumptive use preference? Or, quite independent of Montana’s needs, downstream states conceivably could marshal the votes to alter or abolish the preference.

Another aspect of the status quo continues to encourage isolationism in the development and management of interstate water: putting water to beneficial consumptive use within a state remains the best hedge against the water claims of other states. At least as among multiple prior appropriation states, historic consumptive uses are likely to continue to prevail over projected uses in interstate litigation under the doctrine of “equitable apportionment.”³³ Since the Missouri Basin encompasses states that follow competing riparian and prior appropriation laws, however, the outcome of equitable apportionment litigation among them is somewhat unpredictable. Also, the day may dawn in our lifetimes when well-documented reservations of water for fish, wildlife, recreation, water quality and orderly growth may be fully sanctioned (even preferred over ill-conceived, hasty appropriations) within the flexible bounds of the equitable apportionment doctrine. In the world of the here and now, however, “investment-backed expectations” associated with early consumptive use and development continue to be protected by the U.S. Supreme Court.

How Conventional Will the Future Be?

On balance, conventional wisdom probably would suggest that a basinwide water apportionment compact is not foreseeable. But conventional wisdom for all its value, can blind people to both incremental and innovative change. It can dull senses that ought to be used to detect new challenges and opportunities.

It does not take much imagination to conceive of credible scenarios that would motivate headwater and flatland states alike in this basin to seek a compact. What if a Middle East conflagration triggered an all-out program of domestic energy mobilization involving calls for the further federalization (aka nationalization) of fossil fuel and related water resources? What if climatic change expanded the northern reach of irrigable lands in this region but reduced dramatically the snowpack in your headwaters? What if an accidental nuclear explosion radiated water supplies in other basins, creating unexpected growth and export demands on the Missouri Basin? What if catastrophic floods and river channel changes in the lower Mississippi prompted the nation to move toward a massive federal erosion and sediment control program for the Missouri and Upper Mississippi river basins?

May not the important point be simply this: Headwater states should not expend all their time and talent erecting elaborate fortresses. Attention should continue to be given to basinwide problems and solutions. And people within the state apparatus ought to be asked to ponder “improbables” such as regional water agreements and institutions, so your state can better maximize its positions and opportunities in the event the unexpected happens.

TOWARD A RIVER BASIN COMMUNITY

Compacts represent one way states can formally relate to one another. Consensus can take other forms. The process of exploring common interests and uncommon differences need not lead to formal compact negotiations. Compacts are optional. The process of communicating and cooperating with neighboring states is less optional. Events may never compel you to consider a basinwide compact. But the ongoing process of developing a clearer sense of an interstate community of interest arising from a common dependence on a river system may be important for your state’s identity and welfare. Arguments ought to focus not on compacts, but on perceptions of your river basin

community. The improbability of a basinwide compact should not prevent you from asking some of the same questions about interstate, state-tribal, and federal-state relations that would be posed by serious compact negotiations. What do you want your state’s relationship to your basin, your Indian tribes, your sister states and your federal government to be? You are actively engaged in pursuing many of the issues contained in those larger questions. In time, Montana’s water policies and practices will reflect its answers to those overarching questions as readily as a pool reflects the image of one peering into it.

FOOTNOTES

1. *Kansas City Southern Ry. v. Andrews*.
2. *Sioux City Journal*, May 6, 1984.
3. *Omaha World-Herald*, April 17, 1984.
4. H.R. 2516.
5. Boris and Krutilla, **Water Rights and Energy Development in the Yellowstone River Basin** (1980); Doerksen, **Columbia River Interstate Compact: Politics of Negotiation** (State of Washington Water Research Center, 1972); and Council of State Governments, "Missouri River Basin Compact, Revised Draft" (January, 1953).
6. U.S. Const. art. I, Sec. 10: "No State shall, without the consent of Congress***enter into any Agreement or Compact with another State***"
7. Hutchins, **Water Rights Laws in the Nineteen Western States**, Vol. III, at 82-84 (1977).
8. Muys, **Interstate Water Compacts** (Legal Study 14, National Water Commission, July, 1971), at 248; *Virginia v. Tennessee*, 148 U.S. 503, at 517-20 (1893); cf. dictum in *Dyer v. Sis*, 341 U.S. 22, at 27. How far states might be able to go in avoiding federal involvement by adopting parallel policies and legislation rather than multilateral written agreements is an intriguing issue beyond the scope of my assignment.
9. Solomon, **Additional Alternative Arrangements for River Basins and Other Regions** (Legal Study 15, National Water Commission, 1971).
10. 58 Stat. 887.
11. The following listing of the western compacts in effect as of 1974 is provided by Hutchins, **Water Rights Laws in the Nineteen Western States**, Vol. III, at 87, fn. 69 (1977): Animas-La Plata Project Compact (between Colorado and New Mexico), 82 Stat. 897 (1968); Arkansas River Basin Compact (between Kansas and Oklahoma), 80 Stat. 1409 (1966); Arkansas River Basin Compact (between Oklahoma and Arkansas), 87 Stat. 569 (1973); Arkansas River Compact (between Colorado and Kansas), 63 Stat. 145 (1949); Bear River Compact (among Idaho, Utah, and Wyoming), 72 Stat. 38 (1958); Belle Fourche River Compact (between South Dakota and Wyoming), 58 Stat. 94 (1944); Canadian River Compact (among New Mexico, Texas, and Oklahoma), 66 Stat. 74 (1952); Colorado River Compact (among Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming), 45 Stat. 1057, 1064 (1928) (the text of this Compact appears in 70 Cong. Rec. 324 (1928); Costilla Creek Compact (between Colorado and New Mexico), 77 Stat. 350 (1963); Kansas-Nebraska Big Blue River Compact, 86 Stat. 193 (1972); Klamath River Basin Compact (between California and Oregon), 71 Stat. 497 (1957); La Plata River Compact (between Colorado and New Mexico), 43 Stat. 796 (1925); Pecos River Compact (between New Mexico and Texas), 63 Stat. 159 (1949); Republican River Compact (among Colorado, Kansas and Nebraska), 57 Stat. 86 (1943); Rio Grande Compact (among Colorado, New Mexico, and Texas), 53 Stat. 785 (1939); Sabine River Compact (between Texas and Louisiana), 68 Stat. 690 (1954); Snake River Compact (between Idaho and Wyoming), 64 Stat. 29 (1950); South Platte River Compact (between Colorado and Nebraska), 44 Stat. 195 (1926); Upper Colorado River Basin Compact (among Arizona, Colorado, New Mexico, Utah, and Wyoming), 63 Stat. 31 (1949); Upper Niobrara River Compact (between Nebraska and Wyoming), 83 Stat. 86 (1969); and Yellowstone River Compact (among Montana, North Dakota, and Wyoming), 65 Stat. 663 (1951).
12. Muys, *supra*, note 8, 5-240.
13. Muys, *supra*, note 8, at 105-202.
14. Comptroller General, **Federal-Interstate Compact Commissions: Useful Mechanisms for Planning and Managing River Basin Operations** (GAO Report to Congress CED-81-34, February 20, 1981).
15. E.g., Muys, *supra*, note 8, at 355-392.
16. The premier history of the 1922 Colorado River Compact is by Hundley, **Water and the West** (Berkeley: Univ. of Calif. Press, 1975), who is contributing a summary and update of Colorado River politics entitled "The West Against Itself: The Colorado River — An Institutional History" to a forthcoming 1985 book (untitled) edited by Lee Brown and Gary Weatherford and scheduled for publication by the University of New Mexico Press. I have relied heavily on Hundley's work in this section of the paper.
17. The text of these compacts appears at 70 Cong. Rec. 324 (1928) and 63 Stat. 31 (1949), respectively, and also in U.S. Dept. of the Interior, **Documents of the Use and Control of the Waters of Interstate and International Streams** (T. Richard Witmer, ed., 1956), at 39 and 218.
18. Barton, **Interstate Compacts in the Political Process** (Chapel Hill: University of North Carolina Press, 1965), at 3.
19. 259 U.S. 419 (1922).
20. Article III, sections (a) and (d).
21. Weatherford and Jacoby, **Impact of Energy Development on the Law of the Colorado River**, 15 Nat. Res. J. 171 (1975).
22. 373 U.S. 546 (1963).
23. 59 Stat. 1219.

24. "The need for a determination of the rights of the respective States to deplete the flow of the Colorado River. . . is most pressing." U.S. Dept. of the Interior, *The Colorado River* (1946) at 21.
25. 63 Stat. 31 (1949).
26. A block of 50,000 acre-feet per year was dedicated to Arizona off the top in recognition of the fact that a small portion of that state is located in the upper basin.
27. 373 U.S. 546 (1963), 376 U.S. (1964), ____ U.S. ____ (1983).
28. Survey of Indian claims in Folk-Williams, *What Indian Water Means to the West* (Santa Fe: Western Network, 1982).
29. The international symposium on Colorado River salinity, 15, *Nat. Res. J.* (January, 1975).
30. 43 U.S.C., Sec. 1501, at 301.
31. *Arizona v. California*, 373 U.S. 546 (1963).
32. Subsection 1(b) of the act (58 Stat. 887) provides:

The use for navigation, in connection with the operation and maintenance of such works herein authorized for construction, of waters arising in States lying wholly or partly west of the ninety-eighth meridian shall be only such use as does not conflict with any beneficial consumptive use, present or future, in States lying wholly or partly west of the ninety-eighth meridian, of such waters for domestic, municipal, stock water, irrigation, mining or industrial purposes.
33. E.g., *Colorado v. New Mexico*, ____ U.S. ____ (June 6, 1984).

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Mark O'Keefe

WATER RESERVATION HISTORY, STATUS AND ALTERNATIVES

The need to protect unappropriated waters in the major geographic basins of Montana for future consumptive and nonconsumptive uses is recognized as a major responsibility of the state in the control of its water resources. Development of the water reservation concept shows a process that incrementally recognized and confirmed the duty of the state to protect the public interest in the use of the state's waters.

Since the early 1900s, Montana has developed a system of law concerning water use which is similar to those in other western states. One aspect unique to Montana water law is the existence of statutes that allow reservation of water today for preferred uses in the future.¹ Adoption of water reservations for the Yellowstone Basin in 1978 was an important move toward future management and control of water use in

the basin.² The implementation of this system in the Yellowstone River Basin was unprecedented in United States history. How Montana makes the system work and how well reservations actually protect the state's waters are worth serious attention by those interested in Montana's water future.

The need to adapt this reservation concept to other basins in the state is commonly acknowledged. The Missouri River Basin is a likely candidate for state-initiated protection in light of recently perceived threats to Montana's future water development. Water marketing discussions, downstream states' claims to large flows for nonconsumptive uses, unquantified federal and Indian reserved water rights in the basin, and conflicting in-state demands on the available water combine to raise serious questions about future

economic and environmental protection options for the Missouri.

State policymakers are currently seeking the best way to protect future water use in the basin. The complex water use situation in the drainage makes the question of how much water is actually available to protect a foremost concern. The uncertainty about present water availability suggests that protective measures for future uses will require further study before any action can be taken.

A variety of options available to the state to set aside water for future uses extends beyond the present water reservation system. Research into appropriate alternatives will involve inventorying possible developments in the Missouri Basin and examining the effectiveness of each alternative to protect Montana's water in an interstate setting.

For Montana to make wise decisions on the many water use options it faces, it is necessary to monitor and evaluate not only in-state activities, but also changes in

regional and neighboring states' thinking on water use activities that affect Montana. Such vigilance will be rewarded with important insights about what Montana's neighbors are thinking and what the state may need to do to assure that avenues for future water development remain open.

Any water management decisions made by Montana about the preferred future uses of its water must be rewarded after weighing all available strategies in light of both state and federal law. The steps Montana has taken in the past toward protecting its water resources have shown wisdom, imagination, initiative and fortitude. However, the next steps, particularly those to protect future uses in the Missouri Basin, warrant further study before they are taken. The need to protect future water use does not forestall the decisions being contemplated by the state on water marketing. How to protect water resources and preserve Montana's quality of life is the real question, not when to protect.

THE WATER RESERVATION CONCEPT IN MONTANA

The concept of water reservations in Montana is often viewed as a relatively new idea, precipitated by the influx of water use applications submitted to the state by energy companies in the mid-1970s. But the reservation of water for specific uses has a much broader historical base in Montana.

To Montanans, water has always been the one natural resource worth fighting for. One story goes that the first murder committed after Montana received statehood took place on Burnt Fork Creek in the Bitterroot Valley as two irrigators "discussed" their rights at the headgate. The survivor pleaded "justifiable homicide."

With the drought of 1917-1921, Montanans began to realize that the water that flowed through the state was the lifeblood of the state's economic mainstay: agriculture. Drought threatened the agricultural community and alerted the state's leaders to the need for solutions to water shortages and their devastating effects on the populace. But the attitude of outsiders toward drought in Montana is exemplified by the Minneapolis Daily News in the early 1900s: "Don't pity Montana. . .

The wealth is there in a soil so rich and productive that you could just about take a sack of it to a bank in

Belgium and draw interest on it." All Montanans had to do was stop complaining and "hang on, keep a stiff upper lip."

In the mid-1920s, the rain returned. Survivors of the drought again tasted the prosperity that comes with ample water, but 1929 brought the Depression and a new, more severe drought. Responding to the need for federal or regional assistance, the 1931 Legislature authorized Montana to participate in the Mississippi Valley Water Conservation Commission and charged it to cooperate with other member states in the development of water projects. To accomplish this monumental task, the legislature appropriated only \$2,000 for the 1931-32 biennium.¹

Responding to the nationwide depression and the initiation of work programs by the federal government, Montanas Governor Cooney approached President Roosevelt with the idea of developing a Water Conservation Project in Montana with funds available through the Public Works Administration.⁴ On January 9, 1934, the governor signed House Bill 39 and created the State Water Conservation Board (SWCB).⁵

The main purpose of the SWCB was to promote

public welfare and protect the public interest by selecting and directing water storage and distribution construction projects. The SWCB was given authority to file water appropriations on all unappropriated waters of the state for use in future projects.⁸ As a result, the SWCB reported to the legislature that, as of 1960, its program represented "the state's investment in the development of its water resources." The SWCB further stated that its program "preserves for Montana a prior right to use water for its projects as against claims which might subsequently be made for water used by downstream states." This statement illustrates the early role state government played in the reservation of water for future use in the public interest.

Reservations of water for purposes other than agriculture also have a historical record in Montana. Several laws in existence prior to passage of the 1973 Water Use Act reserved streamflows for various purposes. As early as 1955, the state Water Pollution Council established a classification system for Montana's waters and set criteria for maintaining water quality.⁹ This classification system was based on a 1947 statute passed in response to municipal concerns about the declining quality of Montana's domestic water.⁹ Updated in response to the 1965 Water Quality Act passed by Congress, these classifications are still used by the state in protecting water quality for designated beneficial uses.

The statutory forerunners of instream reservations for fish and wildlife protection appeared in the early 1960s. Historically, the state has managed fisheries with an eye toward protecting and enhancing trout production. In 1962, the Montana Fish and Game Department demonstrated the economic importance of this resource by estimating that fishermen spent over \$36 million pursuing their sport.¹⁰ They also stated that:

"Montana is losing good trout stream habitat at an alarming rate. Stream straightening, dam building, channel changing, pollution, siltation, irrigation and overgrazing of stream banks by livestock are all taking their toll. Trout stream habitat is going 'down the drain' so fast that we cannot even adequately inventory the losses."¹¹

Responding to the potential economic loss to Montana, the state's Jaycee organization lobbied for protective legislation which resulted in passage of the Stream Preservation Law in 1963.¹² This law requires any state agency or subdivision of the state planning a water development project that has the potential to change the existing natural streambed to notify the Fish and Game Commission. The commission can require modification of the plans if any fish or game habitat is adversely affected. Although this law specifically exempts any State Water Board or irrigation project from its provisions, it can still be viewed as a step toward recognition of the public interest in fish and wildlife. It

also illustrates early legislative thinking concerning the protection of stream flows as an essential component of fish and wildlife habitat.

The Stream Preservation Law did not address whether the public could acquire a prior right to a stream as a fishery resource by using it for that purpose, but that question was addressed by the Montana Supreme Court.¹³ In 1966, the court concluded that this type of public right could not presently be established, but indicated in the following excerpt that such a public interest should be recognized:

"The Fish and Game Commission does not deny that DePuy has a valid appropriate right to the waters of Armstrong Spring Creek. In fact the Commission made no attempt to prove that the amount of water actually put to a beneficial use by DePuy was less than the amount claimed and diverted. The Commission does maintain that the public has a prior right in the waters of the creek which would require DePuy to release some water through a fish ladder. The public right urged by the Commission would be based on the fact that the public had used the creek as a fishing stream and natural fish hatchery before DePuy built his dam. Under the rule of *Bullerick v. Hermsmeyer*, 32 Mont. 541, 554, 81 P. 334, DePuy could not use the water to the detriment of prior rights. Such a public right has never been declared in the case law of this state. California, an appropriation doctrine jurisdiction, whose Constitutional provisions relating to water rights are virtually the same as Article III, 15 of the Montana Constitution, has recognized such a right and has upheld statutes requiring fishways. *People v. Glenn-Colusa Irr. Dist.*, 127 Cal. App. 30, 15 P.2d 549. Under the proper circumstances we feel that such a public interest should be recognized. This issue will inevitably grow more pressing as increasing demands are made on our water resources. An abundance of good trout streams is unquestionably an asset of considerable value to the people of Montana."¹⁴

During the 1969 Legislature, Representative James E. Murphy sponsored House Bill 450 which granted the Fish and Game Commission authority to appropriate unappropriated waters on 12 specific streams, in amounts necessary to maintain instream flows for the preservation of fish and wildlife habitat. Testimony heard in the committee hearings hinted at the concept of protecting these fisheries, reflecting both economic and public interest concerns.¹⁵ To a question concerning the intent of the legislation, Murphy responded that this bill would establish a priority "for maintenance of minimum stream flow to protect fish habitat."¹⁶ With the signing by the governor in 1969 of what is now commonly known as "Murphy's Law" and the

subsequent filings for water rights on the 12 streams, Montana was finally in the reservation business.

As early as 1971, Montana enjoyed the reputation of being an aggressive leader in protecting its waters for future in-state uses.¹⁷ Key policy shapers were discussing potential downstream threats to our water resources as well as intrastate problems of preserving fish and wildlife and agricultural resources.¹⁸ Public awareness of the threats to our water was blossoming and executive branch leaders felt impelled to work toward a system that would protect the interests of all Montanans.

The 1973 Water Use Act

On May 1, 1972, the newly organized Montana Water Law Advisory Council held its inaugural meeting in Helena.¹⁹ Organized in response to the new Montana Constitution (Article IX, Section 3),²⁰ this nine-member council was charged to review existing water law and recommend changes in those laws for the 1973 Legislature. From the discussions and suggestions of the committee, the water reservation system as we now know it was born.²¹

From May of 1972 to January of 1973, the Water Law Advisory Council debated the future of Montana water law. In the first two weeks of October 1972, the Advisory Council's staff hammered out a system that would have given reservations the same status as water "rights."²² A draft of the proposed legislation suggesting this approach was criticized by the council members at the October meeting. After lengthy discussion, the council members agreed that, although the reservation concept was apparently sound, reserved waters should not be given the status of "rights." They also decided that only public agencies should be permitted to reserve waters for minimum flows and other beneficial uses without requiring a diversion. The council decided to add a Water Reservation section to its draft that recognized the reservation of water as a valid appropriation of the state's waters.²³

This version of the Montana Water Use Act was presented to the citizens of Montana in November of 1972. At public hearings in Missoula, Billings, Miles City, Glasgow, Great Falls and Bozeman, Montana citizens first discussed the proposed new water law. There were few comments concerning the reservation language, but those received were generally supportive.²⁴ The proposal eventually became SB 444 and was introduced in the legislature just ten months after formation of the Montana Water Law Advisory Committee. Senate Bill 444 became Montana's 1973 Water Use Act.

Although many people consider the 1973 water reservation law a significant break from past practices,

many individuals concerned with current water use practices were probably not surprised at all. The historical trend hinted at in earlier laws seemed to point toward reservations as a logical direction for Montana.

Prior to these developments, there had been a 1967 legislative directive for Montana's Water Resources Board to develop a state water plan.²⁵ This planning effort reflected a recognition that the state's water resources would be subject to increasing pressures. If the public interest was to be protected, a central plan would be needed for future development and conservation of the state's waters. For the State Water Plan to be of any value, it would be necessary for the state to have a mechanism in place to make future uses fit the plan. Otherwise the plan would be useless. The Montana reservation system not only provided a method of developing a comprehensive basin water use plan, but also gave the state a means of implementing a state water plan.²⁶ Without realizing it, Montana had been looking for just such an instrument since the drought of 1917.

Yellowstone River Basin

The reservation system provisions in the 1973 Water Use Act were not long in place before Montana realized the immediate need to proceed with the reservation of water in the Yellowstone Basin. One day in 1974, a water rights specialist for the DNRC looked at the stack of water right applications for energy development in the Yellowstone Basin and decided to do some figuring. Punching the numbers into his calculator produced a clear picture of the large-scale industrial water demand soon to occur on the Yellowstone River system.²⁷ It was obvious that if the basin was to be managed for future agricultural development and protected as a fishery, immediate action had to be taken to protect the drainage.

In light of these large industrial applications in 1974, the legislature took action authorized by Article IX of the Montana Constitution²⁸ and imposed a three-year moratorium on issuing water rights in the Yellowstone Basin.²⁹ During this period, the DNRC was to determine existing rights on the river and establish reservations "as rapidly as possible for the preservation and protection of existing and future beneficial uses."³⁰ This moratorium put a hold on any action concerning major new water use permits³¹ on the Yellowstone and, upon approval of any reservations, recognized the resultant reserved flows as superior to any rights granted to new or suspended permit applications.

The Water Moratorium Act of 1974 provided Montana with the chance to plan the future use of Yellowstone Basin water by making use of the existing reservation law. Pursuant to this law, the DNRC

eventually received 35 applications from public entities for reservations of water in the Yellowstone Basin. On December 13, 1976, the DNRC issued a two-volume draft environmental impact statement for public comment³² followed, in February of 1977, by a revised final environmental impact statement.³³ It was anticipated that the Board of Natural Resources and Conservation would make final determinations on the applications by the end of the three-year moratorium: March 18, 1977. It has been suggested that "only a reading of the accounts of the eventual Board proceedings on these reservation applications will illustrate how absurd the March, 1977 deadline was."³⁴

Because of the complexity of the task facing the board, the legislature extended the Yellowstone Moratorium until January 1, 1978.³⁵ The extension language included an important caveat that allowed the moratorium to be stretched even further, until January 15, 1979.³⁶ With the additional extension the Board of Natural Resources and Conservation finalized the Yellowstone Reservations on December 15, 1978.³⁷

This seven-member citizen board had faced an unprecedented task in establishing reservations in the Yellowstone Basin. During the moratorium, they had examined numerous technical studies, reviewed a substantial draft and final environmental impact statement, and sat through a seven-week public hearing.³⁸ Acting under the administrative rules previously established for reviewing reservation requests,³⁹ the Board began its arduous task of quantifying and ranking future reservations.

Faced with partially complete applications, no precedent for water reservations of this sort, unquantified Indian and federal reserved water rights, uncertainty in the Yellowstone Compact allocations, unquantified pre-1973 water rights and requests for more water than was physically available, solutions appeared virtually impossible. But by the end of 1978, Montana had its first major basin with water reservations.⁴⁰

In its final order of December 15, 1978, the board attempted to deal with all the problems of conflicting demand. The board divided the basin in half and established priorities according to the time each order was signed to try to balance the requests of municipalities, agriculture, instream advocates (both agricultural and environmental), and multi-purpose (storage) applicants.

A point of division was established at the mouth of the Bighorn River and the priorities established as follows: first priority granted to municipal reservations; second priority granted to minimum flow reservations above the mouth of the Bighorn River (excluding the Bighorn River watershed); third priority granted to irrigation reservations; fourth priority granted to minimum flow reservations below the mouth of the Bighorn River (including the Bighorn River watershed); and fifth priority granted to multi-purpose

reservations.⁴¹

The board's decision was not without controversy. Since the final board order, changes have been made in the reservation statute to limit future instream reservations to a maximum of 50 percent of the average annual flow of record on gauged streams.⁴² A second amendment allows the board to modify existing or future orders reserving water for minimum flow or quality so as to "reallocate such reservation or portion thereof to an applicant who is a qualified reservant" without affecting the priority date of the reservation.⁴³ Another 1979 change required individuals seeking to use water from a conservation district reservation to apply to the district, which must in turn inform DNRC. This language also required DNRC to maintain records and to provide technical and administrative assistance to the conservation districts in these matters.⁴⁴ All of the changes in the reservation law appear to be responses to the board's implementation of the Yellowstone Reservations and in each case appear to be compromises to avoid litigation that might have led to the invalidation of the entire Yellowstone proceedings.⁴⁵

Current Status of the Yellowstone Reservations

Issuance of the final board order establishing the Yellowstone reservations marked the beginning of actions involving the utilization of reserved waters. As one board member put it, now "the monkey is on the applicant's back."⁴⁶ Since Montana's statutes require a review of all reservations at least once every ten years, it is essential that reservants actually put the water to use if their reserved rights are to remain intact.

One last item to consider in the current picture of the Yellowstone Basin is a group of multipurpose rights granted by the board. Totalling 1,111,500 acre-feet annually, these reservations were made for proposed future storage by the U.S. Bureau of Reclamation and the DNRC. With these reservations in effect, study by the Bureau of Reclamation continues on the viability of three offstream storage reservoirs on the Yellowstone, while the state is examining enlargement of the Tongue River Dam. Development of any of these sites, with a 1978 priority date because of the reservations, could be important in whatever water marketing strategy is adopted by Montana in the future.

THE LEGAL STATUS OF RESERVED WATERS IN MONTANA

The primary objective of the reservation process in Montana is the establishment of water rights to meet the needs and interests of the public, as represented by the various public agencies. Under provisions of the 1973 Water Use Act, the board can approve the reservation of water for beneficial use in the future while assigning a present-day priority date to the reserved water. One seldom-discussed concern about these reservations is their legality in light of existing western water law.

The reservation of water for future uses as conducted in Montana is a useful method of quantifying and documenting potential uses.⁴⁷ However, in a situation that calls for the equitable apportionment of a basin such as the Missouri, these reserved waters may not be protected as well as Montanans would like. Because of the nature of the reserved waters in Montana, it is conceivable that the federal courts could ignore or invalidate the reservations.

The most likely scenario in any interstate allocation of the Missouri would involve limiting depletions for all basin states.⁴⁸ In such a case, each state would have to keep its diversion below a level agreed upon by all basin states. In determining this level of depletion, existing uses and future claims would be examined and challenged. The validity of Montana's reservations in this interstate arena appears questionable, due in part to the structure of the system itself.

What appears to be missing in our reservation system is the proper recognition required to make a water use a water right. Under the provisions of the reservation statute, reserved waters when put to beneficial use are still open to review and modification by the board. The amount of protection the present system affords Montana's future uses is an untested question to be resolved by the courts. This situation, which in itself should not adversely affect water allocation decisions in an intrastate setting, makes it clear to other states that Montana's reservations may not have the present capacity to rise to the level of a legally recognized appropriation.

Case law on the validity of Montana's reservation system as a legal means to protect water resources is

scanty at best. Protection of a future water use has been examined in several instances by the courts, and to some extent it has been upheld. In a 1910 Utah case, the Utah Supreme Court held that an application for a permit to put water to use was indeed the basis for "an inceptive right subject to contingencies," but went on to say that recognition of such a right was not enough in itself to constitute a valid appropriation.⁴⁹ In a Nebraska Supreme Court case, it was found that an applicant who held a permit to appropriate water actually had a "contingent appropriation to the extent of his grant which gives him the prior rights to the use of this water against all subsequent claimants." The Nebraska court also stated:

"Appropriation, as applied to water rights, is often loosely used by the authorities, and in general it is used with reference to a claim to the use of the water of a public stream from the time of the inception of the right, at all the intermediate stages, and down to the time when the last act is accomplished by which the right is finally and completely secured."⁵⁰

Other cases have addressed the ability of a water use permit holder to halt actual appropriation of water that would detrimentally affect a planned, undeveloped use. In *Basinger v. Taylor*, the Idaho Supreme Court stated that the holder of an undeveloped permit had "nothing but an inchoate right" until water was actually put to beneficial use.⁵¹ Similarly in *Yuba River Power Company v. Nevada Irrigation District*, the California court found that an undeveloped permit was a "constructive right," and an "incomplete right," implying that such a right did constitute an interest in real property.⁵²

The cases listed above seem to indicate that a permit not yet perfected, while not constituting a vested property right, does have some value to the holder. However, the water reserved and utilized under Montana's water reservation system does not appear to be capable of achieving the status of a perfected permit. The inability to issue permits for the development of

reserved waters, or to elevate reserved water to the status of water right upon utilization of the water, leaves the reservations open to legal attack.

Another unresolved issue that may affect the viability of the reservation system is whether or not any private rights are violated by a system which removes from availability waters that were previously open for appropriation by private entities. This issue was raised in *Wyoming Hereford Ranch v. Hammond Packing Company*; the Wyoming Supreme Court said that the establishment of such control by the state was not a serious infringement on individual rights.⁵³

It is clear that the establishment of water reservations for future uses is an important step in establishing a framework for the right to use undeveloped Montana water. By assigning a present-day priority to these future uses, the system operates in much the same manner as

an application for a permit to appropriate water in preserving the priority date until the project is completed. But it is unrealistic to believe that in an interstate setting, the priority of a 1978 or 1988 reservation will stand against a later dated water right that has actually been constructed and developed.

One positive note is that the built-in mandatory review process in our reservation system might be sufficient to establish the record of due diligence that goes into the development of the water resource. As time goes on and the reservations are honed, Montana's use of a reservation system may become very important when allocations are made based on state water plans for future use. The question of legality hinted at here can only be solved in the courts. Until it is, policymakers should remain aware of the potential controversy and seek solutions to problems prior to their development.

PROTECTION OF MISSOURI BASIN FLOWS FOR MONTANA'S FUTURE USE

The question of how best to protect the water of the Missouri Basin for future use in Montana has been an ongoing discussion for many years. In anticipation of the 1983 legislative session, the DNRC examined this question in depth in the study commonly referred to as the "Use It or Lose It" report.⁵⁴ The component of the recommended strategy that has attracted the strongest interest is that which calls for establishing a claim to water for future in-state needs.

The issue of what type of claim process is most desirable in an interstate water allocation proceeding was presented to the 1983 Legislature in SB 51. The existing reservation system must be modified so as to strengthen the resultant claims to water for Montana's future needs. To accomplish this, several unanswered questions must be addressed, and a protection mechanism must be developed that assures that Montana's claims for future water use will be recognized in an interstate setting.

The quagmire of water use issues in the Missouri Basin of Montana adds to the uncertainty of Montana's ability to protect water for future needs. Clarification of issues including hydropower rights, Federal and Indian reserved rights, and wild and scenic rivers reserved rights is essential if Montana wishes to work with realistic numbers concerning water available in the basin. The ongoing statewide adjudication of existing rights in Montana will also be important for the water availability question. Any system designed to protect future developmental or instream flows becomes a ludicrous exercise if the protected water does not exist. If it is decided that water is not available to satisfy the estimated future demands in certain sections of the basin, alternatives not previously examined must be evaluated, such as offstream storage projects or the potential of groundwater development.

In the establishment of the Yellowstone River reservations, one of the initial steps was to anticipate

future water demands. Identification of quantities required in the future for our municipal, rural domestic, instream, agricultural, and industrial users must be accomplished prior to any valid Montana claim being recognized by other Missouri Basin states.

To properly identify potentially irrigable lands, time must be allowed to assess the basin's soil characteristics, topography, climate and land ownership patterns. Irrigated land in the basin must be examined, and the need for supplemental irrigation water considered. Development costs for each tract of land must be determined and benefits projected. Quantities of water necessary for these potential projects must be accurately determined.

For domestic water developments, a determination of population growth and its associated water needs must be made. The need for adequate supplies of high quality water year-round will also dictate research on the question of surface water versus groundwater sources. An appropriate per capita consumption rate must be determined and agreed to among the various users in the basin.

The volume of water required to sustain water quality and aquatic and associated habitat in the various portions of the basin must also be calculated. Although portions of this work have been completed by the agencies involved, final determinations of appropriate flows will require continuing research and documentation.

One of the biggest obstacles to the establishment of the Yellowstone Basin reservations was the lack of complete and concise information available to the board. When responding to a questionnaire that, in part, dealt with the role of technical information needed to arrive at water reservations, the majority of the board stated that the available information on hydrology, municipal requirements, and industrial requirements was insufficient. Three of the seven board members felt there wasn't enough information on agricultural requirements. Even more troublesome to the Board was the lack of organization of the available data. The information presented was not sufficiently clear in any reservation request.² A key lesson from the Yellowstone proceedings is that before the process begins, all the proper research and evaluations should be completed and concisely documented.

Once the appropriate data have been gathered and the issues in the Missouri Basin hammered out to the extent possible, the state must choose the best method available to protect its future uses in the basin. The current reservation system, with some modification, may be the best means available to protect these future uses. The use of the process on a basinwide scale would certainly provide the state with a comprehensive, unified basin management plan that would take into account both current and future depletions. However, as the system exists today, there remain legal questions about the reliability of the process for protecting these future uses

against downstream threats.

The establishment of water reservations in the Yellowstone River Basin was actually a unique case because the Board of Natural Resources and Conservation did not have to deal with massive nonconsumptive mainstem hydropower rights in allocating future flows. What precipitated the Yellowstone reservation process was not only the current situation in the basin, but also recognition of the need to protect such highly valued uses as agriculture and instream flows for fish, wildlife, recreation and water quality. While the present water reservation process does provide the state with a mechanism for the consideration of economic, social and environmental concerns in managing a basin, it also represents a significant departure from the recognized legal structure of the prior appropriation doctrine. Any method of effecting a future water allocation that deviates from accepted western water law must minimize the tendency toward unreasonable speculation. If it doesn't do this, it will be suspect.

What are the alternatives to the present system of preserving future water rights for society's valued uses? A nationwide search of water laws shows that few, if any, comparable systems have been developed to deal with this problem. Other western states have developed methods of preserving instream flows,³ but none actually deal with the reservation of water for future consumptive uses in a manner that resembles the unified approach taken by Montana. In some cases, such as Wyoming's system of appropriation, the storage of water or the functioning of the permit system itself acts to reserve water for future development.

Several options to the current reservation system have been suggested since establishment of the Yellowstone reservations in 1978. Those who have studied the process in the Yellowstone and who have dealt with the confirmed reservations since then always handle the topic of modifying our present system with kid gloves. The reason for this is that many feel the shortcomings of the current system are not monumental and this being the case, the "don't fix it if it ain't broke" theory is evoked. The general feeling of satisfaction with the results in the Yellowstone Basin tends to obscure the fact that there may be better options for protecting other major basins.

Several alternative water reservation methods, some possibly better, some obviously worse, have been suggested. Many western states rely on basinwide state plans to define their own future water needs. These types of state water plans are often only lists of projects which may or may not be developed in future years. This sort of inventory of development potential is less complete than the planning and investigation needed to secure a reservation in Montana and as such appears inferior. This type of claim to future uses may be most prevalent in any attempt by downstream states to make claims against Montana's water and as such Montana

may need only to counter those claims.

Under a suggested "block" reservation system, the board could approve blocks of water for various sub-basins that would be reserved for future demands. This alternative would allow a lead agency to inventory potential future needs in each use category and present all the pertinent data in an application for a reserved block of water. The block could then be partitioned by use category for distribution by the lead agency. This method of reserving water would permit the board to assess the future needs of all potential uses simultaneously, as was done in the Yellowstone Basin. Making one agency responsible for the application for and distribution of the reserved water could simplify the process and result in more efficient administration. Disadvantages would be the loss of local control and centralization of power in the lead agency.

Suggestions have been made for modification of the existing permitting statutes to allow for the issuance of permits well in advance of project construction. By requiring much the same information as is now required by the reservation statute, the state could, with some assurance that the project would be completed, issue water use permits 10 or 20 years before the water is used. This system would allow private individuals to undertake projects with long lead times knowing that the water required is reserved for their use. For such a system to be worthwhile, there would have to be incremental progress on the project to substantiate the permit. A disadvantage to this type of future claim would be the piecemeal approach it would necessitate for basinwide planning. Even if the extended permits were limited to highly valued uses, it would be virtually impossible to get a good overview of what may happen in the future of a basin.

If the state chooses to utilize the existing water reservation process in the Missouri Basin, there are several changes that could help strengthen the resultant claims to future flows.

The DNRC now has two active applications for water reservations in the Missouri River Basin. Approximately a dozen others were submitted and subsequently withdrawn.³⁷ Of the two active applications, one involves municipal water for the city of Lewistown, while the other deals with the reservation of groundwater in Sheridan County. Rather than

approaching reservations in an incremental manner, it may be wise to insure that reservations are applied to the mainstem of the Missouri and its tributaries in a concentrated program. This basinwide approach could help strengthen the reservations in years to come.

The concept of reserving water for industrial use should also be considered. The existence of such a reservation would allow the state to market industrial water in the future if the decision to pursue water marketing is made. If marketing is not desired, the state at least will have another mechanism to control the growth of industry by requiring industrial users to qualify for the use of reserved industrial flows.

The reservation approval process also needs to be improved in some ways. The Yellowstone procedures provide valuable lessons concerning such items as hearing procedures, public involvement, data presentation, technical assessments and formulation of the final board order. From the ongoing review and reporting process, insights can be gained into how the process worked well and how it didn't.

Another consideration, mentioned in the DNRC's **A Water Protection Strategy for Montana**, is that the state may wish to upgrade the position of the reservants — and subsequently of the state — whose projects move from general concepts to engineering plans by making the reservations into permits upon completion of the state review process.³⁸ This change could strengthen Montana's position and diffuse some of the legal concerns about the status of Montana's reserved rights.

The basic question of instituting reservations in the Missouri River Basin will undoubtedly be addressed by future legislatures. When, how and to what extent reservations are implemented will be the largest concerns. Consideration of the issues will invariably be tied to the water marketing debate. The need for future protection is inseparably entangled with the marketing question, but cause and effect interactions are not as severe as some claim. Reservation of water in the Missouri is not essential prior to deciding the marketing issue. Water marketing, at least from the storage in Fort Peck Reservoir, does not necessarily preempt future water reservation options. Both issues are important in the overall basin picture, but neither option excludes the other.

CONCLUSION

Water reservations in Montana work well as a planning and management tool among in-state water users. How reservations will fare in protecting Montana's right to future water development in an interstate arena is untested. The need to evaluate the intertwined issues of the Missouri River Basin before selecting the appropriate protection measures must again be emphasized. If the reservation system is deemed

best for the Missouri Basin, lessons learned in the Yellowstone Basin process must be heeded and appropriate adjustments made. Before any decision is made, optional methods of protecting Montana's water for future uses should be catalogued, investigated and evaluated. The final decision should provide a strategy appropriate to the complex water use situation in the Missouri Basin.

FOOTNOTES

1. Montana Code Annotated, 85-2-601-603 (1979).
2. Montana, DNRC, Order Establishing Water Reservations.
3. Montana, State Water Conservation Board, Summary of Activities From Inception January 22, 1934 to June 30, 1960, by Kelly (1961), p. 61.
4. *Ibid.*
5. *Ibid.*, pp. 1-2.
6. *Ibid.*, p. 3.
7. *Ibid.*, p. 5.
8. Sheridan, *Water Water Everywhere — But? A Study of the Politico — Administrative Aspects of Water Development in Montana* (Report No. 9, Montana University Joint Water Resources Research Center, 1968): 64.
9. Revised Codes of Montana Annotated 1947 and Cumulative Supplement, 1965, 69-4813, hereinafter referred to as R.C.M. 1947.
10. Montana, Fish and Game Department, Biennial Report, May 1, 1960 — April 30, 1962 (1962). (This work is entitled *Montana Wildlife*), p. 21.
11. *Ibid.*
12. Presently codified at MCA 87-5-501 through 87-5-509.
13. *Paradise Rainbows v. Fish and Game Commission* 148. Mont. 412, 421, p. 2D 717, 1966.
14. *Ibid.*, p. 421, 2pD at 721.
15. Montana Fish and Game Committee, Senate Minutes, 40th Legislative Sess., 5 and 7 February, 1969.
16. *Ibid.*, 5 February 1969.
17. Dewsnup, *Legal Protection of Instream Water Values* (Report to the National Water Commission, Arlington, Virginia, September 1981), p. 21.
18. Helena, Montana, interview with James Posewitz, Dept. of Fish, Wildlife and Parks, (hereinafter referred to as DFWP), 21 March 1984; interview with Ted Doney at his law offices, 22 March 1984.
19. Helena, Montana, Water Law Advisory Council Meeting (hereinafter referred to as WLAC) Minutes, (1 May 1982), p. 1.
20. Mont. Const. art. IX:
Section 3, WATER RIGHTS. (1) All existing rights to the use of any waters for any useful or beneficial purpose are hereby recognized and confirmed.
(2) The use of all water that is now or may hereafter be appropriated for sale, rent, distribution, or other beneficial use, the right of way over the lands of others for all ditches, drains, flumes, canals, and aqueducts necessarily used in connection therewith, and the sites for reservoirs necessary for collecting and storing water shall be held to be a public use.
(3) All surface, underground, flood and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial use as provided by law.
(4) The legislature shall provide for the administration, control, and regulation of water rights and shall establish a system of centralized records, in addition to the present system of localized records.

21. Helena, Montana, WLAC Meeting Minutes of 29 Sept., 1972, p. 1.
22. Posewitz, interview, 21 March 1984; and Doney, interview, 22 March 1984.
23. Helena, Montana, WLAC Meeting, Minutes of Oct. 30, 1972.
24. Gary Wicks, Director, Department of Natural Resources and Conservation (hereinafter referred to as DNRC), letter to Senator Will Lowe, Helena, 5 January, 1973, WLAC file.
25. Montana Code Annotated, 85-1-101 (10) (1979).
26. James L. Huffman, **The Allocation of Waters to Instream Flows: Montana Water Resources Management**, Final Report to the Office of Water Research and Technology, U.S. Dept. of Interior, Vol. IV (July, 1980), p. 22.
27. Helena, Montana, interview with Gary Fritz, DNRC office, 20 March, 1984.
28. Mont. Const. art. IX, sec. 3.
29. Montana Code Annotated, 85-2-601-603 (1979).
30. Montana Code Annotated, 85-2-601 (1979).
31. Diversions of over 20 cfs or storage of over 14,000 acre-feet. R.C.M. 1947, sec. 89-9-103, et.seq.
32. Montana, DNRC, Yellowstone River Basin Draft Environmental Impact Statement for Water Reservation Applications (2 vols.) (1976).
33. Montana, DNRC, Yellowstone River Basin Final EIS for Water Reservation Applications (1977).
34. Huffman, **Allocation of Water to Instream Flows**, p. VI-26.
35. Montana Laws, Chapt. 26 § 1 (1977).
36. "... if a court stays or enjoins the continuance of proceedings on any pending application for reservation of water . . . and such stay or injunction prevents the Board from making a final determination on such application before January 1, 1978" in which case the court could extend the moratorium by the length of the delay up to January 15, 1978. MCA 85-2-603(1)(c), 1979.
37. Montana, DNRC, Order of the Board of Natural Resources and Conservation Establishing Water Reservations (1979).
38. Ted J. Doney, et al., **Yellowstone Water Reservations: Decisionmaking by a Citizen Board**, Utilizing Scientific Information in Environmental Quality Planning, (Minneapolis: American Water Resources Association, September, 1979), p. 105.
39. Montana Administrative Code 36-1.14R(1) — § 1400 (1979).
40. Doney, et al. discuss the Board's role in the reservation process in **Yellowstone Water Reservations**.
41. Montana, DNRC, Order Establishing Water Reservations.
42. Montana Code Annotated 85-2-316(5) (1979).
43. *Ibid.*, 85-2-316(10) (1979).
44. *Ibid.*, 85-2-316(11) (1979).
45. Huffman, Allocation of Water to Instream Flows, pp. IV-24 and IV-152 — IV 153.
46. Wilson F. Clark, **The Yellowstone River Water Reservations — A Summary and Overview**, unpublished paper (6 January 1979), p. 7.
47. Montana, DNRC, Water Resources Division, p. VI-15.
48. *Ibid.*, p. VI-11.
49. *Sowards v. Meagher*, 108 P. 112, Utah (1910).
50. *In re Commonwealth Power Company*, 143 N.W.937, Nebraska (1913).
51. *Basinger v. Taylor*, 164 P. 522, Idaho (1917).
52. *Yuba River Power Company v. Nevada Irrigation District*, 279 P. 128, California (1929).
53. *Wyoming Hereford Ranch v. Hammond Packing Company*, 14, 236 P. 764, Wyoming (1925).
54. Montana, DNRC, Water Protection Strategy for Montana.
55. Doney, et al., **Yellowstone Water Reservations**.
56. Dewsnup, **Legal Protection of Instream Water Values**, p. 39-44.
57. Helena, Montana, interview with Sue Higgins, DNRC offices, 19 April, 1984.
58. Montana, DNRC, Water Protection Strategy for Montana, p. VI-18.

GROUP TWO: BANNING WATER USE

The second group of papers addresses Montana's ability to prevent or control the export of water from the state and focuses on the desirability of retaining the coal slurry ban. The legality of state anti-export laws, including Montana's coal slurry ban, has been

questioned in the context of recent court decisions regarding Nebraska's and New Mexico's laws limiting interstate water transfers. The papers were written as the Select Committee was deciding whether or not to recommend to the 1985 Legislature that the water export

or coal slurry bans should be retained.

The decision by the 1985 Montana Legislature to allow limited water marketing by the state and to eliminate the coal slurry ban has resulted in a variety of changes. Instead of a water export or a coal slurry ban, Montana now places large water transfers by pipeline under public interest criteria and the Major Facility Siting Act.

Clyde

Steven Clyde classifies Montana's proscription of water for coal slurry pipelines as an "embargo" approach. He is convinced that courts will eventually invalidate all state embargo legislation on commerce clause grounds. While acknowledging that Montana's coal slurry ban is not facially discriminatory, Clyde maintains that it is not likely to withstand scrutiny because of the practical effect it has on interstate commerce.

The burden caused by the coal slurry ban would probably not be incidental, and would likely outweigh any benefits to Montana. Moreover, while the coal slurry ban represents a legitimate state interest in preserving limited water for the health and prosperity of its citizens, the courts could find that the state has other means to accomplish this goal, means that do not impermissibly burden interstate commerce or frustrate a national policy of energy independence.

Clyde recommends measures that the state could employ to guarantee water for beneficial uses considered superior to coal slurry. Though these measures could be preempted by congressional legislation, he asserts that they are less vulnerable to challenge and therefore more likely to preserve water for the state.

Dumars

Charles Dumars examines recent New Mexico court cases regarding groundwater exports. The message of

the courts is clear: a state may not interfere with the interstate use of water merely by asserting state ownership.

Dumars reviews instances where states have participated in markets for their natural resources, and reviews the U.S. Supreme Court decision upholding South Dakota's ability to manufacture and sell cement to its residents only. But he asserts that these initiatives may not totally support a Montana water marketing program.

States can choose one of two approaches to establish control over water resources within their boundaries. One approach is to demonstrate clearly the non-discriminatory, conservation purposes of a ban on particular uses. The second is to develop a plan of use that makes the state the central actor in the marketing of water for consumptive uses.

Regardless of the approach used, Dumars argues that the state must transcend the fictional ownership problem by creating a defensible planning process, at a minimum.

Englund

Karl Englund acknowledges several valid perspectives in Dumars's paper but cautions against hasty revisions of Montana law based on New Mexico's experience. In the first place, he notes that *Sporhase* dealt with a groundwater issue while Montana is mainly concerned with surface water. In the second place, Englund believes that pre-1985 Montana law had already incorporated many of the changes New Mexico had made in order to bring its invalidated statute into compliance with the court's principles.

Englund further argues that Montana has several constitutional and statutory provisions that clearly indicate its intent to conserve, preserve and protect water in the state. While some of the processes — adjudication, negotiation of reserved water rights and establishment of the public trust doctrine — are incomplete, they are being steadily pursued and, taken together, constitute a comprehensive management philosophy within which the coal slurry ban may be consistent. Englund also recommends continuation of the use of special public interest criteria and of the requirement of legislative approval for large appropriations, and the implementation of a moratorium on large appropriations from certain river basins.

clause does not preclude all state regulation that may have an effect on interstate commerce. Goetz asserts that the local purpose of the coal slurry ban can be judged to outweigh its effect on interstate commerce.

Goetz also argues that Montana's law is not discriminatory — much like the state's coal severance tax which was eventually upheld by the U.S. Supreme Court. The Montana ban affects both intrastate and interstate coal slurry lines and, for that reason, may not become victim to the economic protectionism argument applied by the court in *Sporhase*. Because the coal slurry ban is constitutionally defensible, Goetz recommends its retention as law.

Goetz

Jim Goetz argues that the prohibition on using water for coal slurry is constitutional because it is based on water conservation principles and because the commerce

SUMMARY

The coal slurry ban was a symbolic gesture — a statement about industrialization, railroads and progress. But, because it was a risky surrogate for a proper regulation of the myriad effects of a coal slurry line, the Select Committee recommended its elimination. While this ban was repealed by the 1985 Legislature, the analysis by the presenters provides insight on the commerce clause limitations on state regulation of interstate water transfers.

Clyde and Dumars assert that Montana's pre-1985 approach to regulating interstate water transfers was inappropriate and that there are other reasonable ways to accomplish the same end. They each discuss expanded roles for the state that could allow it to control exports

and develop water in Montana.

Although it might not have been his direct intention, Clyde reveals an often overlooked dimension concerning water: it is not equally valuable in all of its uses and, obviously, treating it as though it were free tends to drive it from higher valued to lower valued uses. Thus, argues Clyde, it is patently absurd to suggest, as Montana's coal slurry ban did, that there could be no possible source of Montana water that could not be beneficially used as a slurry medium. He uses the example of brackish water or industrial/sewer effluent. This insight will help to introduce the third group of papers which deals with the value of water to prospective buyers.

Charles Dumars

LEGAL PARAMETERS OF A STATE-CONTROLLED WATER MARKET

In this paper I begin by relating the impact of the *Sporhase v. Nebraska* and *El Paso v. Reynolds* cases on New Mexico. I describe New Mexico's response to these legal precedents. In part two I outline the impact of these and other recent decisions on formation of a state-controlled water market, and in the final section I comment on the steps that may be necessary to assert state control over water resources and raise what I hope are relevant questions.

New Mexico is a state that has followed a system of prior appropriation water law since before statehood. Under this system the first person to divert water for beneficial use obtains an alienable property right in the water diverted. This water law has been further refined to promote maximum beneficial use of water resources by allowing transfers of these rights by sale to others for beneficial use. The New Mexico "public," in effect, has been considered the owner of the water resource in trust

for the citizens who could use it so long as it was not wasted or abandoned. If the right is wasted or abandoned, it is forfeited and made available to another member of the New Mexico public.

Because the New Mexico “public” was considered trustee and sole owner of the resource, only New Mexicans could use the resource. This doctrine was reflected in a statute that prohibited transportation of groundwater for use out-of-state. This concept of exclusive state use of water resources was acknowledged by Congress in legislation that unilaterally approved the division of surface waters among states and by Congressional approval of interstate compacts that gave exclusive use of surface water to each of the signatory states. The groundwater of a state, however, has rarely been before Congress either as a part of a specific act of Congress authorizing its exclusive use within a state, or as part of an interstate compact, except where the groundwater is interrelated with surface water. Based on an early Supreme Court case, however, many legal scholars had concluded that a state’s groundwater could be limited to use exclusively within a state.

In *Sporhase v. Nebraska*,¹ the United States Supreme Court faced the question of whether the federal (commerce clause) interest in the free flow of goods among the states invalidated state statutes like Nebraska’s, which prohibited the interstate transportation of groundwater unless the receiving state permitted exportation.

The Supreme Court struck down the reciprocity clause of the Nebraska groundwater transportation statute and extended the “commerce clause” principles to groundwater transfers, treating water as a “good” sold in interstate commerce. In doing so, however, the court acknowledged that water in the arid West is different—arid states need to conserve water for the future. It indicated that federal legislation authorizing states to maintain groundwater stocks within their borders would be an acceptable solution. Likewise, interstate compacts were cited as examples of appropriate means for resolution of this problem. Finally, the court concluded that water conservation is a legitimate purpose that could justify a state’s prohibition on the exportation of groundwater.

In 1983, the New Mexico federal district court in *El Paso v. Reynolds*² ruled that New Mexico’s absolute embargo on groundwater exportation was unconstitutional. It held that the statute was “tantamount to economic protection.”³ While acknowledging that states have a legitimate interest in the conservation and optimum utilization of their water supply, an absolute barrier was held to be not narrowly tailored to meet these goals. The District Court naturally relied on *Sporhase v. Nebraska*. In response to the *El Paso* decision, New Mexico amended its water appropriation statute and repealed the embargo law. The federal district court is now evaluating the constitutionality of the new law.

New Mexico’s New Exportation Statute

The anti-exportation statute struck down in *El Paso v. Reynolds* explicitly banned the out-of-state transport and use of New Mexico groundwater.⁴ The new statute, in contrast, provides that “under appropriate conditions” the interstate transportation and use of New Mexico’s public waters are not in conflict with the public welfare of the state’s citizens or the conservation of the state’s waters.⁵ In referring to “public waters,” the new statute is not limited to groundwater, but also encompasses surface waters.

The statute requires that the person or entity desiring to export water from New Mexico shall apply for a permit from the state engineer approving the withdrawal.⁶ In addition to requiring the state engineer to publish notice of the permit application,⁷ the statute stipulates that the state engineer, prior to granting the permit, must find that the withdrawal and transportation of the water outside of the state will not impair existing water rights.⁸ The state engineer must also find that the proposed export is neither contrary to water conservation policies within the state nor otherwise detrimental to the public welfare of New Mexico’s citizens.⁹ In making the decision, the state engineer shall consider but is not limited to the following factors:

- 1) the supply of water available to New Mexico;
- 2) water demands of New Mexico;
- 3) whether there are water shortages within New Mexico;
- 4) whether the water that is the subject of the application could feasibly be transported to alleviate water shortages in New Mexico;
- 5) the supply and sources of water available to the applicant in the state where the applicant intends to use the water; and
- 6) the demands placed on the applicant’s supply in the state where the applicant intends to use the water.¹⁰

The statute further provides that by filing an application to export New Mexico water, the applicant shall submit to the New Mexico law governing the appropriation and use of the water.¹¹ The state engineer is empowered to condition the permit to guarantee that the water, although going out-of-state, will be used in accordance

with the rules and regulations imposed upon in-state users.¹²

In response to the *El Paso* court's observation that New Mexico law had placed no conservation restrictions on in-state groundwater permit applicants,¹³ the New Mexico legislature amended its in-state groundwater withdrawal criteria. Prior to the *El Paso* decision, the in-state groundwater application statute required the state engineer to issue a withdrawal permit if he found that unappropriated groundwater was available and that the withdrawal would not impair existing water rights.¹⁴ Following the *El Paso* ruling, in-state applicants must meet two additional criteria: the appropriation must not be contrary to water conservation within New Mexico or detrimental to the public welfare of the state's citizens.¹⁵

In addition to amending the statute, the New Mexico legislature in Law 1983, Chapter 98 created the "water law study committee" composed of five members appointed by the governor. The committee was charged with the obligation to "study, examine and evaluate the impact and implications for the water resources available to the state of recent court decisions concerning water and interstate commerce." The legislation stated further that the committee "shall report to the governor and the legislative council on or before January 1, 1984, which report shall include recommendations concerning any modifications or amendments to New Mexico water laws."¹⁶

The committee report to the legislature started with the premise that the *Sporhase* case conveys the following message loud and clear: If a state wishes to maintain its groundwater resources, it must establish control by asserting a proprietary interest in those resources. The committee isolated three constitutionally acceptable methods for asserting this interest. The first method is to have Congress authorize maintenance of water within a state's boundaries. The second method is for New Mexico to negotiate a compact with appropriate sister states and have that compact approved by Congress. The third method (recommended for further study but not immediate implementation) is state appropriation. The committee reasoned that in *Sporhase*, the Supreme Court ruled that the "public ownership" that states like New Mexico had relied upon as a basis for exclusive use of the water within the state was little more than a "legal fiction." However, actual appropriation by a state of its groundwater would convert the asserted ownership from "legal fiction" to reality and give the state the control necessary to conserve for its future needs.

The need to conserve water for the future is a function of the amount of current and future demand. In light of *Sporhase*, anticipated demand must be extended to include out-of-state as well as in-state demand.

The magnitude of these deficits caused the committee to conclude that the economies in these areas will face very serious adjustment problems over the next four decades. It is understandable that planners in these

states would look for every possible means for mitigating these problems and, to a large degree, water importation may be the only option available for obtaining anything close to the large quantities of water needed to eliminate these deficits without reducing demand.

At a minimum, water shortages of the magnitude indicated will clearly affect the competitive climate for water among western states. Moreover, most of the states contiguous to New Mexico have more highly developed economies with a correspondingly greater ability to overcome legal and economic obstacles to importation. The committee stated: "Prudence dictates that New Mexicans recognize the character of this changing climate related to water deficits in neighboring states and their possible implications for the state of New Mexico. What now is a concern largely confined to areas near borders of sister states may conceivably expand to other areas of the state as water becomes steadily more valuable in neighboring states. The state of New Mexico must take action to respond to this possible expansion."¹⁷ The committee then made the following recommendations:

- 1) The state should make every effort possible to have the Congress of the United States act in some way to allow New Mexico to maintain its water resources within its boundaries.
- 2) The state should enter into compact negotiations with the state of Texas to clarify the division of surface water of the Rio Grande below Elephant Butte Dam and thereby clarify the status of the related groundwater as well. (*The El Paso v. Reynolds* decision created uncertainty as to the nature of the division of surface waters of the Rio Grande below Elephant Butte Dam. The committee concluded that a compact with Texas would provide the certainty that would be in the interest of both states and would clarify the status of related unappropriated groundwater since surface rights would have to be purchased and retired as the groundwater is pumped.)
- 3) The state should fund immediately a study of the possibility of state appropriation of unappropriated groundwater and investment of the capital necessary to extract and distribute the water. (State appropriation was recommended only for study and not for immediate implementation. The recommendation was described as "a means of last resort if neither a federal solution nor an interstate compact could be reached." This recommendation is discussed in more detail later.)
- 4) The state should act immediately to place a five-year moratorium on the granting of new permits for unappropriated groundwater where excessive demand exceeds water supply and where there is confusion regarding the state's

allocation of the water. Such a moratorium should not be allowed to affect existing vested water rights, and should allow appropriations for emergencies. The geographic extent of such a moratorium was left to the legislature. (The committee reasoned that before any arid state allocated any underground waters, it must have good hydrologic information. This information is not yet available in some areas of the state of New Mexico.)

The legislature adopted some of the recommendations of the committee and in 1984 placed a two-year moratorium on virtually all new appropriations of groundwater at or below Elephant Butte Dam and funded a study of possible state appropriation of groundwater. A movement has also taken place to explore the possibility of a compact and federal legislation.

New Mexico's response to the *El Paso* case raises a number of fascinating federalism questions regarding water. The federal legislation and the compact options are not discussed in this paper. Rather, because the theme of this conference is water markets, I assume the primary interest is in evaluating the legal parameters of a state's right to control its water resources and to market those resources.

limitation, known as the "dormant" commerce clause, requires a state statute regulating interstate commerce to be nondiscriminatory in its treatment of in-state and out-of-state interests, to further a legitimate state interest, and to not unduly burden interstate commerce.¹⁸

When, however, a state acts not as a market regulator but as a market participant, then the dormant clause limitation does not apply. The dormant commerce clause does not apply because the state, acting as a buyer or seller in the marketplace, does not actually regulate commerce. Instead, a state that buys or sells in the market has rights similar to a private business in deciding the who, what and when of buying and selling.

Accordingly, the United States Supreme Court has held that a state that purchases goods can discriminate in favor of the state's residents. In *Hughes v. Alexandria Scrap Corp.*,¹⁹ the court upheld a Maryland statute that facially discriminated against nonresidents. In an attempt to reduce the number of abandoned cars in the state, Maryland had enacted a statute that paid a bounty to state-licensed processors of abandoned cars. Processors whose plants were located outside of Maryland were required by the statute to provide more extensive documentation, which in effect limited the benefits of the bounty program to in-state processors. The Supreme Court held that the dormant commerce clause in no way restricted a state's ability to purchase items from whomever it wanted.

When a state acts as a seller of goods, it is also immune from dormant commerce clause scrutiny. In *Reeves, Inc. v. Stake*,²⁰ the United States Supreme Court upheld South Dakota's preference statute that authorized a state-owned cement plant to sell only to state residents. In upholding the South Dakota statute, the court found that South Dakota fit within the "state as market participant" classification by acting as a private citizen in the manufacture and sale of a product.

In its most recent decision involving a local government acting as a market participant, the Supreme Court held that the mayor of Boston could constitutionally require that all city-funded construction projects be performed by a work force that contained at least half city residents in *White v. Massachusetts*.²¹ As a purchaser of construction services, the city of Boston was a market participant.

The question left unanswered by both *Reeves, Inc.* and *White*, was whether the "market participant" theory of state exemption from the commerce clause applied to natural resources owned by the state. That issue was answered in this current term of the United States Supreme Court in *South Central Timber Development, Inc. v. Esther Wunnicke, et. al.*²² There, pursuant to an Alaska statute, the state of Alaska published a notice that it would sell timber under a contract only if there would be "primary manufacturing" of the logs by some private entity in Alaska before they were shipped out of state. A

Evaluating the Parameters of Reassertion of State Control Over Water

The commerce clause allocates federal power to Congress to regulate interstate commerce. If a state statute conflicts with a federal statute that concerns interstate commerce, then the federal statute will control. Where no conflict exists, the federal power to regulate commerce still limits action by a state. This

company that shipped logs into foreign commerce without any processing challenged the law as discriminatory market regulation of the processing business, rather than legitimate market participation in the lumber sale business. On appeal, the United States Supreme Court agreed with the company.

Alaska argued that its statute had been authorized by federal law. The Supreme Court first rejected this argument and then turned to the commerce clause. The court pointed out that there were two distinct markets—the timber sales market in which Alaska is a participant and the timber processing market in which Alaska does not participate.

The court concluded that to regulate indirectly the timber processing market by conditioning timber sales on in-state processing was akin to an illegal restraint on alienation or a violation of the antitrust laws by imposition of vertical rule restraints. It concluded: "Instead of merely choosing its own trading partners, the state is attempting to govern the private, separate economic relationship of its trading partners; that is, it restricts the post purchase activity of the purchaser, rather than merely the purchasing activity."²³

The exact holding of the full court is unfortunately somewhat opaque because of the split in opinions of the various justices, but it appears at a minimum that a majority of the court would hold that the state "market participation doctrine" does apply to natural resources and the doctrine allows a state to "... impose burdens on commerce within the market in which it is participant, but allows it to go no further."²⁴ The state "... may not avail itself of the market participant doctrine to immunize its downstream regulation of the timber-processing market in which it is not a participant."²⁵

The relationship of this case to water markets is obvious. It strongly suggests that the state as owner and allocator of water rights can elect to deal with whomever it chooses. However, it cannot use its choice to regulate a secondary downstream market. If water rights are sold outright by the state, and the buyer elects to sell those rights to a third person in the private water market, the state may be powerless to stop it. Similarly, if water is leased, and if a figuratively "downstream" market for subleases is allowed to exist, then the state cannot condition its initial leases on the lessee's promise to sublease in any way that discriminates against commerce.

Montana's "market participation" in water matters is limited to the initial distribution of the water. If it is an outright sale, its power may end at preferring Montana residents over others. If Montana chooses to sell to a person from Colorado, management may be beyond Montana's jurisdiction. Likewise, if Montana issues a lease, it must choose to have all leases revert to the state after a term of years. If, however, it allows any sublease market to be created, then it cannot regulate that

sublease market, in which Montana is not a participant, in a manner that discriminates against commerce.

The Role of Planning in Sustaining a Position of State Ownership in Water Marketing

At first blush it would appear obvious that the unappropriated water in a state is the property of that state. However, *Sporhase v. Nebraska*²⁶ and *Colorado v. New Mexico II*²⁷ raise serious doubts about this proposition. Indeed, *Sporhase* squarely held that public ownership of the unappropriated water in Nebraska was a "legal fiction" and *El Paso v. Reynolds*²⁸ followed *Sporhase*. This is true, even though the constitutions of these two states proclaim the water to be a public good. *Colorado v. New Mexico II* adds support to the proposition that the mere geographic fact that water originates within a state is almost irrelevant to the issue of state ownership. The court in *Colorado v. New Mexico II* ... "rejected the notion that the mere fact that the Vermejo River originates in Colorado automatically entitles Colorado to a share of the river's waters." It stated later: "The source of the Vermejo River's waters should be essentially irrelevant to the adjudication of these sovereigns' competing claims."²⁹

The issue then is how can states reassert their sovereignty over water resources within their boundaries? Merely passage of a statute that says, "It's ours and we really mean it this time" will not get the job done. As noted above, in New Mexico we have begun a study of precisely this question. Although it has scarcely begun, two things seem clear: (1) the state will have to expend its own capital to develop its water resources as South Dakota did with cement in *Reeves v. Stake* as a part of the water resources market; and (2) where water is not currently needed, but will be marketed in the future, states will have to engage in long-range planning to use it within the state to its maximum and to market it as a part of the same state plan. This point was also made clear in *Colorado v. New Mexico II*:

Colorado objects that speculation about the benefits of future uses is inevitable and that water

will not be put to its best use if the expenditures necessary to development and operation must be made without assurance of future supplies. We agree, of course, that asking for absolute precision in forecasts about the benefits and harms of a diversion would be unrealistic. But we have not asked for such precision. We have only required that *a state proposing a diversion conceive and implement some type of long-range planning and analysis of the diversion it proposes. Long-range planning and analysis will, we believe, reduce the uncertainties with which equitable apportionment judgments are made* (emphasis added).¹⁰

Colorado failed to gain even a drop of water from a river within its borders in this equitable apportionment action because it had not, at a minimum, acted to study the future uses and water conservation measures available to it. "It may be impracticable to ask the state proposing a diversion to provide unerring proof of future uses and consistent conservation measures that would be taken. But it would be irresponsible of us to apportion water to uses that have not been, at a minimum, carefully studied and objectively evaluated. . . ."¹¹

How much capital expenditure is necessary? How much study? How much flexibility will a state have even if its ownership of water is deemed more than a "legal

fiction"? These are questions that demand answers. The Yellowstone Compact cases will be watched carefully by all. I am confident that as among compacting states, congressional approval of a compact reserves a quantity of water for each compacting state. However, it is in no way clear that this precedent bears any relationship to related groundwater in storage that can be taken without impacting the surface water. Nor is it clear what the implications would be on a buyer from a non-compacting state who buys water for use in his or her own state from a willing seller.

In terms of the overall need for present state action to control future water resource allocations, it should also not be forgotten that by simple amendment of the Desert Lands Act of 1877, Congress could appropriate all of the unappropriated water on the public domain to future federal uses or could elect to allocate it on a lease basis similar to coal or natural gas. This is not to say this outcome is likely, but only to remind us of the power of the federal government to appropriate water on the public domain.

I realize I have not given "pat" answers to the questions I have raised because, as of yet, there are none. I hope through exchanges of ideas in conferences such as this one, these answers will emerge.

FOOTNOTES

1. 458 U.S. 941 (1982).
2. 563 F. Supp. 379 (D.N.M. 1983). For an excellent description of the facts and issues in this case see Comment, New Mexico's Water Exportation Statute; Will it Float? *Natural Resource Journal*. (To be published July 1984).
3. 563 F. Supp. at 390.
4. N.M. Stat. Ann. §72-12-19 (1978).
5. N.M. Stat. Ann. §72-12-(B)-1 (Cum. Supp. 1983).
6. *Id.* at 72-12(B)-1(B) (Cum. Supp. 1983).
7. *Id.*
8. *Id.* at 72-12(B)-1(C) (Cum. Supp. 1983).
9. *Id.*
10. *Id.* at 72-12(B)-1(D).
11. *Id.* at 72-12(B)-1(E).
12. *Id.* at 72-12(B)-1(F).
13. N.M. Stat. Ann. §72-12-3 (1978).
14. N.M. Stat. Ann. §72-12-3(E) (1978).
15. N.M. Stat. Ann. §72-12-3(E) Cum. Supp. (1978). As to surface waters, however, the "public interest" has always been a criterion for appropriation.
16. Laws of New Mexico, 1983 Chapter 98.
17. See, Report to Governor Toney Anaya and the Legislative Council, *The Impact of Recent Court Decisions Concerning Water and Interstate Commerce on Water Resources of the State of New Mexico*, Chapter IV, p. 5.
18. *Pike v. Bruce Church*, 397 U.S. 137 (1970).
19. 426 U.S. 794 (1976).
20. 447 U.S. 429 (1980).

James H. Goetz

THE CONSTITUTIONALITY OF MONTANA'S PROHIBITION OF THE USE OF WATER FOR COAL SLURRY

Montana law prohibits the use of water for the purpose of coal slurry by declaring such use not to be a beneficial one. M.C.A. Sec. 85-2-104 provides:

Slurry transport of coal. (1) The legislature finds that the use of water for the slurry transport of coal is detrimental to the conservation and protection of the water resources of the state. (2) The use of water for the slurry transport of coal is not a beneficial use of water.¹

This means that an appropriator may not procure a water use permit for coal slurry purposes under Montana law.

The policy underlying the prohibition on the use of water for coal slurry is, as the statute reflects, one founded on conservation of the resource. The Montana Legislature has determined that coal slurry would be detrimental to Montana's vital interest in conservation of its scarce water supplies. There can be no doubt as to

the importance of the interest of Montana in preservation of its water resource. On the other hand, with the sizable coal resources in eastern Montana and with the need for economical transportation of the coal to market, it is arguable that the coal slurry ban unduly burdens interstate commerce in conflict with the U.S. Constitution. In fact, a case has been filed by the Yellowstone Pipeline Company which challenges a broad array of Montana (and Wyoming) environmental laws, including the coal slurry ban: *Yellowstone River Pipeline Co., A Wyoming Corporation, v. Montana Department of Water Resources and Conservation*.²

The Commerce Clause

Among the most important of the powers delegated to the central government by the U.S. Constitution is the power of Congress to regulate interstate and foreign commerce. Art. I, Sec. 8, cl. 3 provides that Congress shall have the power "to regulate commerce with foreign nations, and among the several states, and with the Indian Tribes. . . ." By its terms the Commerce Clause is an *affirmative* delegation of power to the Congress to regulate commerce. The clause, however, has traditionally played a *dual* role: it is a *source of national power*, commonly referred to as the "dormant" Commerce Clause power.³ The U.S. Supreme Court recently put it this way:

Although the Commerce Clause is by its text an affirmative grant of power to Congress to regulate interstate and foreign commerce, the Clause has long been recognized as a self-executing limitation on the power of the State to enact laws imposing substantial burdens on such commerce. . . . *South-Central Timber Development, Inc. v. Wunnicke, Dept. of Natural Resources of Alaska et al.*, May 22, 1984.

The purpose of the Commerce Clause was to promote commercial harmony among the states. As the Supreme Court put it, the Commerce Clause was designed "to avoid the tendencies toward economic Balkanization that had plagued relations among the colonies and later among the States under the Articles of Confederation," *Hughes v. Oklahoma*, 1979.

While the Commerce Clause serves as a limitation on the exercise of state power which burdens interstate commerce, it does not preclude all acts of the state simply because such acts result in some burden on

interstate commerce. Some are allowed, some are not. The difficult question is, which are going to be tolerated, which precluded? An early case in 1851, *Cooley v. Bd. of Wardens of the Port of Philadelphia*, attempted to reconcile the competing concerns, holding that states are free to regulate those aspects of interstate commerce so *local* in character as to demand diverse treatment, while Congress alone can regulate those aspects of interstate commerce so *national* in character that a single, uniform rule is necessary. The *Cooley* text has proved vague. It is not easy to define those activities which are "local" in character and those which are "national."

The modern evolution of the *Cooley* text has been articulated by the Supreme Court in 1969 in *Pike v. Bruce Church, Inc.*, as the following:

[T]he general rule. . . can be phrased as follows: Where the statute regulates evenhandedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits. . . . If a legitimate local purpose is found, then the question becomes one of degree. And the extent of the burden that will be tolerated will of course depend on the nature of the local interest involved, and whether it could be promoted as well with the lesser impact on interstate activities.

Again, the application of this test is not simple—it contemplates the weighing of the burden on interstate commerce against the putative local benefits of the legislation. For example, does the benefit to Montana resulting from the conservation of water by precluding coal slurry outweigh the effects on interstate commerce?

One thread running through many of the recent "dormant" Commerce Clause cases has to do with whether the statute is discriminatory. Ordinarily a state protectionist motive is disapproved, *Kassel v. Consolidated Freightways Corp.*, (1981). In the natural resources field the Supreme Court recently invalidated a New Hampshire statute that prohibited a corporation, which generated electricity by water power, from transmitting that energy out of state unless the New Hampshire Public Utilities Commission first approved. The court observed, "Our cases consistently have held that the Commerce Clause of the Constitution. . . precludes a state from mandating that its residents be given a preferred right of access, over out-of-state consumers, to natural resources located within its borders or to the products derived therefrom" in *New England Power Co. vs. New Hampshire* (1982). See also *South-Central Timber Development, Inc. v. Wunnicke, Dept. of Natural Resources of Alaska, et al. supra* (holding violative of the "dormant" Commerce Clause an Alaska statute requiring that the "primary manufacture" [partial processing] of timber sold from Alaska state lands take place in Alaska).

Conversely, one of the reasons the Montana coal

severance tax was found not to be in violation of the Commerce Clause was that it is *not* discriminatory—i.e. the tax applies equally to Montana coal consumed in Montana and that shipped out of state.

In general, the natural resources cases decided in recent years by the U.S. Supreme Court indicate that the states enjoy wide latitude in enacting legislation unless the legislation is facially discriminatory. The courts' guidelines can be summarized as follows: (1) the regulation may not blatantly discriminate against non-residents; (2) the impact of the legislation on interstate commerce may not be severe; and (3) the regulation must be based on legitimate local purposes. See Coetz, *Federalism and Natural Resources, Prologue*, 43 Mont. L. Rev. 155 (Summer, 1982.)

The Sporhase Case

In July of 1982 the U.S. Supreme Court decided *Sporhase v. Nebraska*, invalidating on Commerce Clause grounds a Nebraska statute restricting the out-of-state sale of Nebraska groundwater. The statute required any person intending to withdraw groundwater from any well located in the state and transport it for use in a different state, to obtain a permit from the Nebraska Department of Water Resources. If the Director of Water Resources found that such withdrawal was reasonable, not contrary to the conservation and use of groundwater, and not otherwise detrimental to the public welfare, he would grant the permit, *if the state in which the water was to be used granted reciprocal rights to withdraw and transport groundwater from that state for use in Nebraska*.

The court rejected Nebraska's argument that water is not an article of commerce and hence not subject to the Commerce Clause. The court then strictly scrutinized the Nebraska statute, notwithstanding the court's recognition of the vital interests of the states, particularly the arid western states, in conserving their water:

Because Colorado [the proposed destination state] forbids the exportation of its groundwater, the reciprocity provision operates as an explicit barrier to commerce between the two states. *The state therefore bears the initial burden of demonstrating a close fit between the reciprocity requirement and its asserted local purpose.* *Hughes*

v. Oklahoma, Dean Milk Co. v. City of Madison (1951).

The reciprocity requirement fails to clear this initial hurdle. For there is no evidence that this restriction is narrowly tailored to the conservation and preservation rationale. Even though the supply of water in a particular well may be abundant, or perhaps even excessive, and even though the most beneficial use of that water might be in another state, such water may not be shipped into a neighboring state that does not permit its water to be used in Nebraska. If it could be shown that the state as a whole suffers a water shortage, that the intrastate transportation of water from areas of abundance to areas of shortage is feasible regardless of distance, and that the importation of water from adjoining states would roughly compensate for any exportation to those states, then the conservation and preservation purpose might be credibly advanced for the reciprocity provision. A demonstrably arid state conceivably might be able to marshal evidence to establish a close means-end relationship between even a total ban on the exportation of water and a purpose to conserve and preserve water. Appellee, however, does not claim that such evidence exists. We therefore are not persuaded that the reciprocity requirement—when superimposed on the first three restrictions in the statute—significantly advances the State's legitimate conservation and preservation interest; it surely is not narrowly tailored to serve that purpose. *The reciprocity requirement does not survive the "strictest scrutiny" reserved for facially discriminatory legislation.* *Hughes v. Oklahoma*, emphasis added.

One federal decision has followed *Sporhase*. In 1983 the U.S. District Court in New Mexico held unconstitutional New Mexico's prohibition on the out-of-state export of groundwater. *City of El Paso v. Reynolds*. The court stated:

New Mexico's embargo bars the export of groundwater absolutely; it is an explicit barrier to interstate commerce. Facially discriminatory, it is subject to the strictest scrutiny. Defendants must demonstrate that the embargo serves a legitimate local purpose, that it is narrowly tailored to that purpose and that there are no adequate non-discriminatory alternatives. *Hughes v. Oklahoma*, 441 U.S. 322, 336 (1979). The purpose defendants advance for New Mexico's overall system of groundwater regulation is to conserve and preserve the state's internal water supply. They point to the state's longstanding water management laws, institutions, policies and public expenditures as evidence that the purpose is genuine.

The court rejected New Mexico's purported justification, stating: "The policy of maximizing all 'public welfare' uses of water in New Mexico, and the furthering of that policy by prohibiting interstate commerce in groundwater, is tantamount to economic protectionism."

In speaking of the state's interest in conservation and preservation of groundwater, the *Sporhase* court recognized the potency of the state's interest:

Moreover, in the absence of a contrary view expressed by Congress, we are reluctant to condemn as unreasonable measures taken by a State to conserve and preserve for its own citizens this vital resource in times of severe shortage. Our reluctance stems from the "confluence of [several] realities" *Hicklin v. Orbeck*, 437 U.S. 518, 534 (1978). First, a State's power to regulate the use of water in times and places of shortage for the purpose of protecting the health of its citizens—and not simply the health of its economy—is at the core of its police power. For Commerce Clause purposes, we have long recognized a difference between economic protectionism, on the one hand, and health and safety regulation, on the other. See *H. P. Hood & Sons v. Du Mond*, 836 U.S. 525, 533 (1949). Second, the legal expectation that under certain circumstances each State may restrict water within its borders has been fostered over the years not only by our equitable apportionment decrees, see, e.g., *Wyoming v. Colorado*, 353 U.S. 953 (1957), but also by negotiation and enforcement of interstate compacts. Our law therefore has recognized the relevance of state boundaries in the allocation of scarce water resources. Third, although appellee's claim to public ownership of Nebraska ground water cannot justify a total denial of federal regulatory power, it may support a limited preference for its own citizens in the utilization of the resource. See *Hicklin v. Orbeck*, *supra*, at 533-534. In this regard, it is relevant that appellee's claim is logically more substantial than claims to public ownership of other natural resources. See *supra*, at 7-9. Finally, given appellee's conservation efforts, the continuing availability of ground water in Nebraska is not simply happenstance; the natural resource has some indicia of a good publicly produced and owned in which a State may favor its own citizens in times of shortage. See *Reeves, Inc. v. Stake*, 447 U.S. 429 (1980); cf. *Philadelphia v. New Jersey*, *supra*, at 27-628 and n. 6; *Baldwin v. Fish and Game Comm'n*, *supra*. A facial examination of the first three conditions set forth in Sec. 46-613.01 does not, therefore, indicate that they impermissibly burden interstate commerce. Appellants, indeed seem to concede their reasonableness. (Emphasis added.)

Thus, it appears that *Sporhase* would have been decided in favor of the State had it not been for the facially discriminatory reciprocity provision. Since Montana's coal slurry law lacks the discriminatory feature and since its justification is found in the same principles as the *Sporhase* statute, conservation of scarce water resources, it probably would survive a Commerce Clause challenge. As the *Sporhase* court observed:

Obviously, a state that imposes severe withdrawal and use restrictions on its own citizens

Sporhase Applied to the Montana Statute

The pivotal aspect of the statute challenged in *Sporhase* was the facially-discriminatory reciprocity requirement. If the Montana ban on coal slurry applied only to out-of-state coal slurry, it would be subject to the "strictest scrutiny" and most likely would not survive. The saving feature of the Montana coal slurry ban, however, is the fact that it is *not* facially discriminatory—it bans coal slurry whether in-state or out-of-state. Accordingly, judicial review of the statute is likely to be more highly deferential.

Conceivably an attack could be made premised on the argument that, while the coal slurry ban is not facially discriminatory, it is *de facto* discriminatory because in fact virtually all of coal slurry originating in Montana would be destined for out-of-state. This argument would be dependent on facts that would have to be developed. A similar argument, however, was not favorably received by the Supreme Court in the Montana coal severance tax case. There the court refused to find that Montana's tax discriminates against interstate commerce even though 90 percent of the coal was shipped to other states under contracts that shift the tax burden to non-resident utilities, and therefore, to citizens of other states. In explanation, the court observed:

The Montana tax is computed at the same rate regardless of the final destination of the coal, and there is no suggestion here that the tax is administered in a manner that departs from this evenhanded formula. We are not, therefore, confronted here with the type of differential tax treatment of interstate and intrastate commerce that the Court has found in other "discrimination" cases.

Commonwealth Edison Co. v. Montana, (1981).

In the absence of a discriminatory feature the coal slurry ban is likely to pass constitutional muster. As noted above, the court has generally accorded states a wide latitude in natural resources cases in recent years. Language in *Sporhase* indicates that the latitude may be even wider regarding water issues—areas in which the states have traditionally exercised a great deal of control.

is not discriminating against interstate commerce when it seeks to prevent the uncontrolled transfer of water out of the state.

In sum, "evenhandedness" of application is the key to survival of a constituted challenge. Montana's law appears to be evenhanded and will probably survive.

Future Federal Action

It is possible that Congress may attempt to take action to authorize use of water for coal slurry purposes. Since water is an article of commerce (*Sporhase*), Congress would probably have the constituted authority to enact such legislation under the Commerce Clause. In *Sporhase*, for example, the court rejected Nebraska's argument that it "owned" the waters within the state and that its provisions dealing with state waters were beyond the reach of the Commerce Clause:

If Congress chooses to legislate in this area under its commerce power, its regulation need not be more limited in Nebraska than in Texas and States with similar property laws. Groundwater overdraft is a national problem and Congress has the power to deal with it on that scale.

Thus if Congress enacted legislation which *directly* authorized use of water for coal slurry, such legislation would probably preempt Montana's ban on slurry.

Under the rules of preemption, however, the conflict between the federal and state statutes must be irreconcilable. The test is laid out by the U.S. Supreme Court in *Pacific Gas & Electric Co. v. State Energy Resource Conservation & Dev. Comm'n.*, (1983):

It is well-established that within Constitutional limits Congress may preempt state authority by so stating in express terms. . . . Absent explicit preemptive language, Congress' intent to supersede state law altogether may be found from a "scheme of federal regulation so pervasive as to make reasonable the inference that Congress left no room to supplement it" "because the Act of Congress may touch a field in which the federal interest is so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject," or because "the object

sought to be obtained by the federal law and the character of obligations imposed by it may reveal the same purpose". . . . Even where Congress has not entirely displaced state regulation in a specific area, state law is preempted to the extent that it actually conflicts with federal law. Such a conflict arises when "compliance with both federal and state regulations is a physical impossibility". . . or here state law "stands as an obstacle to the accomplishment and execution of the full purpose and objectives of Congress."

So far the Congress has considered and rejected legislation to provide federal eminent domain powers for the taking of land for coal slurry purposes. If such legislation passed it is doubtful that it would preempt Montana's coal slurry ban because the arguable conflict between the federal and state laws would probably not be direct enough to warrant displacement of Montana's statute. The resolution of such conflict would ultimately depend on rules of statutory construction and the precise language of the federal statute.

It is also possible that the Congress may legislatively consent to Montana's coal slurry ban, thereby immunizing it from Commerce Clause challenge. In *South-Central Timber Development, Inc. v. Wunnicke*, the Supreme Court stated:

It is equally clear that Congress "may redefine the distribution of power over interested commerce" by "permit(ing) the states to regulate the commerce in a manner which would otherwise not be permissible." *Southern Pacific Co. v. Arizona*, (1945).

Such enabling legislation, however, must be clear. In *Sporhase*, Nebraska argued that Congress had authorized the states to impose otherwise impermissible burdens on interstate commerce in groundwater. It based its argument on three statutes in which Congress had deferred to state water law and on a number of interstate compacts dealing with water that had been approved by Congress. In rejecting Nebraska's argument the court said:

Although the 37 statutes and the interstate compacts demonstrate Congress' deference to state water law, they do not indicate that Congress wished to remove federal constitutional constraints on such state laws. The negative implications of the Commerce Clause, like the mandates of the Fourteenth Amendment, are ingredients of the *valid* state law to which Congress has deferred. Neither the fact that Congress has chosen not to create a federal water law to govern water rights involved in federal projects, nor the fact that Congress has been willing to let the States settle their differences over water rights through mutual agreement, constitutes persuasive evidence that Congress consented to the unilateral impositions of unreasonable burdens on commerce. In the instances in which we have found such consent, Congress' "intent and policy to sustain state legislation from attack under the Commerce

Clause" was "expressly stated."

Thus, it is possible to remove any doubt about the constitutionality of the Montana coal slurry ban through

clear authorizing legislation from Congress. The political feasibility of the solution is, however, questionable.

CONCLUSION

Montana's coal slurry ban is probably constitutional because the state retains a very strong police power interest in conservation of its water resource and because

the statute applies evenhandedly. In light of the statute's constitutional defensibility, efforts to modify the statute are not advisable.

FOOTNOTES

1. " 'Slurry' means a mixture of water and insoluble material" M.C.A. Sec. 85-2-102 (12)
2. *The Yellowstone Pipeline Company* case was at a very preliminary stage when, on plaintiff's request, a stay order was entered on December 7, 1983, pending final resolution of *Intake Water Co. v. Yellowstone River Impact Commission*, Civ. No. 1184. The *Intake* case,

which was decided on Oct. 25, 1983, has been appealed. Accordingly it appears that there will be little action on the *Yellowstone Pipeline* case for some time.

3. See generally Anson & Schenkkan, *Federalism, The Dormant Commerce Clause, and State-Owned Resources*, 59 Tex. L. Rev. 71 (1980).

Karl Englund

OPTIONS FOR CONTROLLING EXPORTS OF WATER IN LIGHT OF SPORHASE V. NEBRASKA

I have been asked to give a "Montana perspective" to Professor Charles Dumars' paper concerning the legal parameters of a state-controlled water market. Professor Dumars relates the experience of the state of New Mexico in responding to federal court decisions holding unconstitutional New Mexico's absolute

embargo on groundwater exportation. New Mexico's response contains ideas directly applicable to Montana. However, before we alter our existing water law, we must understand basic Montana law. It is with an eye toward Montana constitutional and common law that I address the excellent paper by Professor Dumars.

We start from the proposition that the United States Supreme Court has looked with disfavor upon absolute bans of the exportation of groundwater. While there are some important differences between groundwater and surface water, we can assume for the purposes of this discussion that the Supreme Court will treat them the same. However, the line of cases to which we are responding, starting with *City of Altus v. Carr*¹ and continuing through *Sporhase v. Nebraska*² and *El Paso v. Reynolds*³ involve only groundwater. The differences between groundwater and surface water may provide an argument why these distinct resources should be treated differently. As I said, I will assume for the sake of discussion that these decisions affecting groundwater will apply to surface water. The Select Committee on Water Marketing, on the other hand, should take a very careful look at this assumption before making any recommendations for change in our basic water law.

New Mexico responded to *El Paso* by passing a statute providing that any person desiring to appropriate groundwater must receive a permit from the New Mexico state engineer. Prior to granting such a permit, the state engineer must find that the withdrawal and transportation of water do not impair existing water rights and the withdrawal is neither contrary to water conservation policies nor otherwise detrimental to the public welfare of the citizens of New Mexico. In other words, New Mexico eliminated its export ban, replacing it with a permit system grounded in its authority to protect the public health and welfare. In addition, New Mexico put in place a two-year moratorium on the withdrawal of groundwater from an area of the state where the extent of the state's rights is uncertain. Finally, with an eye toward a more permanent solution, New Mexico will encourage Congress to pass a law granting it authority to control the water within its boundaries and will enter into compact negotiations with neighboring states.

New Mexico's new permit system appears, on its face, to pass constitutional muster. As the U.S. Supreme Court held in *Sporhase*: "Obviously, a State that imposes severe withdrawal and use restrictions on its own citizens is not discriminating against interstate commerce when it seeks to prevent the uncontrolled transfer of water out of the State."⁴

Professor Dumars did not address the federal legislative and the compacting options. I will address them very briefly. Montana's experience with federal legislation designed to limit the extent of our coal severance tax should make us very wary of putting all of our faith in Congress. Any attempt to exercise complete control over the waters of the state, particularly if coupled with an attempt to get top dollar for the sale of water, will certainly meet with strong reaction from the members of Congress.

Compacting, on the other hand, is perhaps the best way to resolve conflicts among neighboring states and

has been approved of by the U.S. Supreme Court.⁵ However, compacting takes time and the results of negotiations may become moot by the time the compact is reached. This should not discourage Montana from negotiations with our neighboring states. However, we should have alternatives to compacting available in the interim.

So, I argue that federal legislation is the wrong approach and while compacting is preferable, the time involved may make this approach infeasible. That leaves us the question that I am to address: How can we limit the export of water in light of the recent federal court decisions?

I submit we have taken several of the necessary steps and we need only moderate change in our water law to have a workable system in full compliance with the dictates of the federal constitution.

The steps that we have taken are as follows:

1. Although late, we have begun the process of determining how much water is available for future use by determining the extent of existing water rights. As I understand it, this process of quantifying existing rights should be completed by 1990;

2. Recognizing that quantifying federal and Indian reserve water rights by resort to the courts is an expensive and time-consuming process, we have established the Reserved Water Rights Compact Commission to negotiate the nature and extent of these reserve rights; and,

3. We have passed a temporary law providing special criteria for the issuance of permits to appropriate up to 10,000 acre-feet per year. In addition, only the legislature has the authority to approve permits for the consumptive use of 10,000 or more acre-feet per year of water.

In addition to making these changes in our basic water law, we have the following principles of basic Montana law that must be followed:

1. All citizens of Montana have "the right to a clean and healthful environment";⁶

2. The state of Montana and each person have a duty to maintain and improve a clean and healthful environment for present and future generations;⁷

3. All surface, underground, flood and atmospheric water within the boundaries of the state are the property of the state for the use of its people;⁸ and

4. The public has a right to recreational use of the surface of the state's water. Our constitution and the public trust doctrine do not permit a private party to interfere with the public's right to recreational use of those waters.⁹

We can combine all of these provisions of state statute and the dictates of basic law and conclude that we have special criteria for the issuance of a permit to appropriate up to 10,000 acre-feet of water per year. In addition, only the legislature can permit the appropriation for consumptive use of 10,000 or more

acre-feet per year. In exercising these elements of state control, the Montana Department of Natural Resources and Conservation and the legislature must protect prior appropriators and must duly exercise their obligations under the Montana constitution and the public trust doctrine to protect the rights of all citizens to clean and healthful rivers.

This system protects the water resources of the state in a nondiscriminatory manner. However, in order for it to be permanent, and in order to insure full compliance with our basic law, we should make the following changes in Montana law:

1. Our existing statute on large appropriations should be made permanent and made applicable to changes in use of water;

2. Language effectuating the constitutional provisions to a clean and healthful environment and the public trust doctrine must be incorporated into the water law statute itself, insuring that these principles are not forgotten in the day-to-day operation of the Montana Department of Natural Resources and Conservation;

3. The work of the Reserved Water Rights Compact Commission should continue; and

4. Until we know the nature and extent of existing water rights, there should be a moratorium on all large appropriations from river drainages where existing rights, including instream reservations, potentially exceed supply in critical water years.

Such a system is in full accord with *Sporhase*, its progeny and basic Montana law. It would regulate large appropriations evenhandedly to effectuate legitimate

local public interest. Its effects on interstate commerce would be only incidental and any effects on interstate commerce would not be excessive in relation to local benefits. In addition, it would ensure compliance with basic Montana law by placing the dictates of that law within the statute, where it cannot be overlooked by the legislature and the administrative agencies. This is an important point. My experience with effectuating Montana's policy of environmental protection is that administrative agencies, busy and overworked, pay particular attention to the statute and sometimes overlook the basic law upon which the statute is grounded.

The moratorium period allows us the time to gather the information upon which to base comprehensive water development plans, the importance of which are fully discussed in Professor Dumas' paper. It may also allow us the time in which to exercise the compacting option.

Legislative review of large appropriations is not just good law, it is good public policy. Large appropriations, be they for in-state use or for out-of-state use, have the capacity to disrupt our system of prior appropriation and cause the most environmental damage. This is especially true of large appropriations involving consumptive uses. Therefore, providing special criteria for large diversions is appropriate, and providing that only the legislature can approve consumptive uses keeps that important determination in the hands of the elected representatives of the people of Montana, who, according to the public trust doctrine, have a legitimate interest in the health of our water systems.

FOOTNOTES

1. 225 F.Supp. 828 (W.D. Tex.) summarily aff'd, 385 U.S. 35 (1966)

2. 563 F.Supp. 379 (N.M., 1983)

3. 458 U.S. 941 (1982)

4. *Id.* at 955, 956

5. *Colorado v. Kansas*, 320 U.S. 383 (1942)

6. Montana Constitution, Art. II, Section 3

7. Montana Constitution, Art. IX, Section 1 (1)

8. Montana Constitution, Art. IX, Section 3 (3)

9. *Montana Coalition for Stream Access, Inc. v. Curran*, ____ Mont. ____, ____ P.2d ____, 41 St. Rptr. 906 (1984)

Steven Clyde

ALTERNATIVES TO EMBARGO LEGISLATION TO CONTROL OR PREVENT THE USE OF WATER FOR COAL SLURRY TRANSPORTATION

Many western states have adopted embargo legislation to prohibit the exportation of their water beyond state lines. This legislation falls within three generalized but distinct categories.¹ The first allows the exportation of

water only upon legislative approval.² The second allows the exportation only upon a reciprocal basis.³ The third endeavors to create an absolute prohibition on the interstate transportation of water.⁴ The ostensible

purpose of this legislation is to preserve the limited water resources necessary for the health and prosperity of the citizens of the state.

The legislation has been supported by varied groups. These include environmentalists as well as those who desire to maintain their lifestyles and avoid the disruptive social and economic changes associated with rapid population growth and natural resource development.

Increased coal production will necessarily require increased transportation capabilities to move the coal from the mines to distant markets. The coal industry is looking seriously at coal slurry pipeline transportation in lieu of the unit train as a more economical means of moving coal. Coal slurry pipelines present a threat to the railroad industry and have incurred industry opposition⁴ as well as the opposition of those individuals dependent upon the railroads for their livelihood.

There is also an apparent reluctance on the part of one segment of society, or one area, to sacrifice its environment, its water resources, and perhaps its way of life for the economic benefit of another segment of society. The effect of the embargo legislation has been to delay resource development through the creation of legal, but often artificial, water shortages.

The nation must develop alternative energy supplies to lessen its dependency on foreign-supplied petroleum products. Water will be essential to that effort. State regulations that unreasonably interfere with that effort will not likely withstand a commerce clause challenge. The embargo acts of Texas⁵, Nebraska⁶ and New Mexico⁷ have all been tested and each has been struck down as creating an impermissible burden upon interstate commerce.⁸

Many states, including Montana, have recently amended their embargo statutes in response to the *Sporhase* and *El Paso* cases.¹⁰ The amended acts are untested. The burden will clearly be on the states to demonstrate the required "close fit" between the preservation effects of the legislation and their asserted local purpose.¹¹

The Montana Legislature, in 1983, repealed Mont. Code Ann. §85-1-121 by House Bill 908.¹² Consequently, water may now be diverted for interstate exportation, thus eliminating the facially discriminatory portion of Montana's act. The legislature did not amend or repeal Mont. Code Ann. §85-2-104 (1981) which declares that the use of water for coal slurry transportation purposes is detrimental to the conservation and protection of the state's water resources and that use of water for that purpose is not a beneficial use in Montana. Water, of course, can be appropriated only for beneficial uses. This section appears to apply both to new appropriations and also to a change of use of an established right.

House Bill 908 requires legislative approval of large appropriations (in excess of 10,000 acre-feet) and

imposed new public interest criteria that must be met as a condition for approval. The act also requires legislative approval of large use permits for consumptive use. These requirements apply to both intrastate and interstate uses of water. So long as they are applied in an even-handed manner, they should be upheld as constitutional.

The prohibition against using water for coal slurry transportation purposes is not facially discriminatory. It applies with equal force to both inter- and intrastate uses of water for that purpose. Thus, unless the application of this provision unreasonably burdens or interferes with interstate commerce, its constitutionality should also be upheld.

Whether a state act or regulation interferes with commerce turns upon the nature and severity of the burden created and the local purpose served by the act or regulation. Where the act or regulation serves a legitimate local purpose, the beneficial effects of the local interest are balanced against the burdens the act imposes upon interstate commerce.¹³ State acts will be upheld only where they incidentally burden interstate commerce. The test becomes one of degree. The outcome depends on the nature of the local interest involved and whether it could be promoted equally well with a lesser impact upon interstate commerce.¹⁴

The reviewing court should consider the practical effect of the burdens state regulations impose on interstate commerce, rather than merely labels or statements of purpose.¹⁵ State acts and regulations that make pursuing interstate commercial activities economically prohibitive, regardless of their ostensible purpose, are constitutionally void.¹⁶

Water is clearly an article of commerce and is subject to federal regulation and control.¹⁷ Coal slurry pipeline transportation systems, simply because of their size and economic scale, contemplate the interstate movement of coal to distant markets. These pipelines require water as a medium of transportation. Therefore, a ban on the appropriation or use of any water, regardless of its quality, for this purpose as not being a beneficial use may unreasonably interfere with interstate commerce, notwithstanding the existence of a valid local purpose.

Thus, the prohibition on the use of water for coal slurry transportation purposes is not facially discriminatory. The conservation and protection of water is also a valid state purpose. States should have broad latitude in defining what is within the public interest of each state and the Supreme Court should not unnecessarily interfere in that process. Coal slurry pipeline systems, however, will almost always involve interstate activities. Thus, to prohibit the use of any of Montana's water for coal slurry transportation purposes may unreasonably interfere with interstate commerce—especially since Montana's interest in protecting and conserving its water can be promoted through other means with a lesser impact on interstate commerce.

For example, Montana must have sewage effluent, groundwater aquifers containing brackish water or other poor quality water that is not fit for human consumption or irrigation use and that is currently unused. This poor quality water could adequately serve the needs of the slurry pipeline companies. This would leave the state's high quality water available to meet the state's future needs. Denying industry the right to use even Montana's poor quality water is arguably too great an imposition on interstate commerce to pass the balancing test currently employed by the Supreme Court.¹⁴ However, in certain limited situations, the states can interfere with interstate commerce.

Legal precedent exists for states to limit access to resources and marketplaces where the state is acting in the capacity of a market participant rather than market regulator. In *Reeves, Inc. v. Stake*,¹⁵ the state of South Dakota had operated a cement plant for a period of 50 years. It had sold its products both intrastate and interstate. The state later changed its policy and thereafter confined sales to state residents only. The United States Supreme Court upheld this action stating: "South Dakota has not sought to limit access to the state's limestone or other materials used to make cement. Nor has it restricted the ability of private firms of sister states to set up plants within its borders."¹⁶

The state of Montana, through one of its agencies, could appropriate water impounded in a federal flood control facility on the mainstem of the Missouri River. That agency might legitimately restrict its sales of water to citizens of the state for economic development and other beneficial uses. So long as others still had the right to appropriate water under Montana law or to acquire existing rights for use by Change Application in interstate commerce, no commerce clause violation should occur. A significant amount of water could be lawfully removed from private appropriation.

Congress could also consent to state regulation of interstate commerce, even though the regulation, absent such consent, would have created an impermissible burden on interstate commerce. The commerce clause doctrine arises out of a negative implication of the constitutional grant of power to the United States Congress to regulate commerce among the several states. It is not an express limitation on state interference with interstate commerce. As the Supreme Court stated in *Southern Pacific Company v. Arizona*,²¹ since it is Congress' power to begin with, Congress has the power to "redefine the distribution of power over interstate commerce" so as to "permit the states to regulate commerce in a manner which would not otherwise be permissible. . . ."²² This consent must be founded upon something more than mere federal deference to state water laws.²³

Consequently, an express delegation of Congress would be required before states could regulate the exportation of water resources in interstate commerce.

Congress could, however, choose to do this. The coal slurry pipeline bill,²⁴ defeated by the House of Representatives in 1983, contained such a provision. The bill narrowly focused upon the use of water for coal slurry pipelines. Had it passed, it would not have constituted a broad delegation of power to the states to deny their water resources for use in interstate commerce. It would, however, have required pipeline companies to obtain water rights in accordance with state law. If state law prohibits the use of water for coal slurry purposes, that law should control. The states have broad latitude in defining what is in the public interest and can mold the public interest to meet the changing social and environmental values. Water rights are clearly affected by the public interest. Their use is subject to regulation and control, both in the initial appropriation stage and also upon the transfer of established rights to new uses. Water rights, because of the public interest, have been accorded special consideration.

For example, the state of Utah has declared that the use of water for beneficial purposes is a public use.²⁵ The power of eminent domain has been conferred upon a private appropriator to acquire an easement to establish a point of diversion and convey his water across the lands of others to his place of use.²⁶ The right of eminent domain is afforded because the public has a substantial interest in the reclamation of arid lands. The same rationale has been employed to uphold a private appropriator's authority to condemn a right of way to use water for mining purposes²⁷ and to redistribute land from large landholders to resident tenants.²⁸

The Supreme Court in *Hawaii Housing Authority v. Midkiff*,²⁹ decided May 30, 1984, sustained a Hawaiian statute that authorized the state housing authority to condemn lots owned by large landowners that had been leased for long-term residential use, and resell the land upon its acquisition to the tenants, thus forcing a redistribution of land. The landowners challenged the Hawaiian statute on the grounds that their property was not being taken for a public use, but was instead being condemned for the benefit of certain private individuals.

The Supreme Court observed that state legislatures have almost unlimited powers under the Constitution to define the public use. Judicial deference to that determination is required unless it is without any reasonable foundation.

It is not too far an extension of logic to conclude that states can determine what is or is not a beneficial use of their water and what uses of water are within the "public interest." In that context, Montana's determination that the use of water for coal slurry purposes is not a beneficial use should be sustained. The state has the authority to make that determination, but whether or not that determination can withstand a commerce clause challenge will again depend upon the legitimacy of the local interest involved, whether the local interest

outweighs the burdens imposed on commerce and whether that local interest could be promoted equally well with a lesser impact upon interstate activities. However, if Congress consents to this imposition on interstate commerce, the courts should uphold it, and there is nothing in *Sporhase*³⁰ to suggest a contrary result. In the absence of express congressional consent, it is questionable whether any embargo legislation, even as amended, can ultimately be sustained.

The states probably cannot prevent the use of their water in interstate commerce without the support of Congress. They are not, however, totally powerless to control the manner in which their water is used, nor are they without authority to establish and implement policies for the development and allocation of their limited water resources. This can best be accomplished through the use of the appropriation statutes which are in force in one form or another in almost all western states.

The tools are many and varied. They include the ability of states to deny appropriations where they will interfere with a more beneficial use of the water or are contrary to the public interest.³¹ States may also withdraw water from appropriation either through direct legislative withdrawals³² or through statutorily authorized instream appropriations by state agencies.³³ Concepts of beneficial use are also being redefined to include social and environmental values which were not traditionally recognized as beneficial uses.³⁴ States are also allocating rights administratively through the use of short-term appropriations rather than perpetual appropriations.³⁵ State engineers may impose conditions upon the approval of a change of use, to protect not only vested rights from interference but the public rights in the resource as well³⁶ or to encourage better groundwater development through authorized replacement of water and enforcement of reasonable diversion facilities.³⁷ States might also appropriate water through state agencies that could allocate water contractually to preferred users under public interest statutes and reallocate the water to new users upon termination of the contract.³⁸

The state's ability to implement new water policies, however, is not without limitation. It is always subject to the assertion of the superior federal interests.³⁹ Congress will retain its power to regulate commerce, to control navigation, to dispose of federal property and to promote the general welfare of the nation. The failure of Congress to exercise its powers to the fullest extent in the past will not preclude it from doing so in the

future.⁴⁰ The Supreme Court, in *Sporhase*, clearly intimated that Congress might adopt laws regulating groundwater basins because of the national concern about the overdrafting of groundwater basins.⁴¹

The court offered three bases of federal power to regulate groundwater withdrawals. The first is the multi-state character of the Ogallala aquifer and the federal interest in the conservation, as well as the fair allocation, of this diminishing water resource.⁴²

Second, the court notes that Congress has the power under the commerce clause to regulate a groundwater basin.⁴³ Groundwater may be tributary to a surface stream. The withdrawal and use of water could affect navigation which would certainly call into play the dominant federal power to control the navigation.

Third, the court notes that groundwater overdraft is a national problem and Congress has the power to deal with it on that scale.⁴⁴ The court has long held that Congress has the power to provide for the general welfare. It can certainly do so in the field of water law, if and when the need presents itself.⁴⁵

A possible fourth basis might be that some of the groundwater may yet be unappropriated and located within federal land, and thus, regulated under the property clause of the Constitution. The water could be subject to withdrawal and reservation by the federal government.⁴⁶

In conclusion, Professor Frank Trelease has written:

In all of the western states, a water right is a property right, defensible and protected, firm enough to give security to investments and enterprises, flexible enough to allow changes to new and more productive uses, and subject to government controls that insure beneficial use and protect other public interests, including the environment. That is what water law is all about.⁴⁷

States can effectively use the appropriations laws to reallocate appropriated rights to new users and to new uses. It may also use the appropriation doctrine to restrict new appropriations to those in the public interest as a means of implementing state water policy designed to protect emerging social and environmental values. As long as these efforts are not solely protectionist, impose only slightly upon interstate commerce, and further legitimate state goals, they should not be held to violate the commerce clause. Continued state efforts to deny water for energy development through embargo type legislation is contrary to the broader national public interest. Embargo-type statutes will likely fall victim to the national economic interest.

FOOTNOTES

1. For a detailed discussion of the various Embargo Acts see Clyde, *State Prohibitions on Interstate Exportation of Source Water Resources*, 53 U. Colo. Law Rev., 529 (1982).
2. Wyo. Stat. §41-3-105, 41-3-115 (1977); S.D.C.L. Ann. §46-5-20.1 (Supp. 1981); Neb. Rev. Stat. §46-613-01 (1973) and Or. Rev. Stat. §537.810 (1979).
3. Neb. Rev. Stat. §46-613-01 (1973); Nev. Rev. Stat. §523.515 (1979); Wash. Rev. Code Ann. §90.03.300 (1962). Compare with Utah Code Ann. §73-2-8 (1979) amending Utah Code Ann. §73-2-8 (1953) to delete the reciprocity requirement.
4. Mont. Code Ann. §§85-1-121, 85-2-104 (1981); N.M. Stat. Ann. §72-12-19 (1978); Okla. Stat. Ann., tit. 27, §§7.1 and 7.6 (West Supp. 1981) and Colo. Rev. Stat. §37-81-101 (1973 and Supp. 1981).
5. *Energy Transp. Sys. Inc. v. Union Pac. R.R. Corp.*, 456 F.Supp. 154 (D. Kan. 1978), aff'd, 606 F.2d 934 (10th Cir. 1979); *Energy Transp. Sys. Inc. v. Union Pac. R.R. Corp.*, 435 F. Supp. 313 (D. Wyo. 1977), aff'd, 606 F.2d 934 (10th Cir. 1979).
6. *City of Altus v. Carr*, 255 F. Supp. 828, aff'd per curiam, 385 U.S. 35 (1966).
7. *Supra*, Note 3; *Sporhase v. Nebraska*, ____ U.S. ____, 102 S.Ct. 3456 (1982), on remand, the Nebraska Supreme Court held the reciprocity to be severable and upheld the remainder of the statute. *Nebraska v. Sporhase*, 213 Neb. 484, 329 N.W.2d 955 (1983).
8. N.M. Stat. Ann. §72-12-19 (1978); *City of El Paso v. Reynolds*, 563 F. Supp. 380 (D.N.M. 1983); remanded (10th Cir. 1983) 83-1350. The Court of Appeals vacated the judgment of the district court, 563 F. Supp. 380 (D.N.M. 1983) and remand the case for reconsideration in light of the amended Act.
9. U.S. Const. Art. 1, §8, cl.2. the commerce clause.
10. New Mexico repealed §72-12-19, N.S. Stat. Ann., and enacted in its place S.B.295, 36th Leg. 1st Sess'n, (1983) adopting the three conditions of the Nebraska Act which the Supreme Court in *Sporhase* held did not create an impermissible burden on interstate commerce: reasonable withdrawals; not contrary to the conservation and use of groundwater; and, not otherwise detrimental to the public welfare. The amended New Mexico Act is currently being challenged in the U.S. District Court for New Mexico, *City of El Paso v. Reynolds*, No. C-80-730. The 10th Circuit Court of Appeals (10th Cir. 1983) 83-1350, on Dec. 16, 1983. Montana repealed Mont. Code Ann. §85-1-121 by H.B.908, 48th Leg., (ch. 706, 1983). Water may now be appropriated and diverted for interstate exportation. Colorado amended Colo. Rev. Stat. §37-81-101 by H.B. 1567 (54th Leg., 1st Sess'n, 1983). South Dakota amended S.D.C.L. §46-5-20.1 (1981) to facilitate the sale of 20,000 acre feet of water annually to Energy Transportation Systems Inc. (ETSI), and in 1983, amended S.D.C.L. §46-1-13 (1983) to eliminate the requirement of reciprocity by the receiving state. The states of Washington, Oregon and Nevada have not amended or repealed their Embargo Acts.
11. *Hughes v. Oklahoma*, 441 U.S. 332 (1979); *Great Atl. and Pac. Tea Co. Inc. v. Cottrell*, 424 U.S. 366 (1976); *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970).
12. *Supra*, note 10.
13. *Philadelphia v. New Jersey*, 437 U.S. 617 (1978); *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970).
14. *Supra*, note 13.
15. *Hughes v. Oklahoma*, 441 U.S. 322 (1979).
16. *Pennsylvania v. West Virginia*, 262 U.S. 533 (1923); *West v. Kansas Nat. Gas Co.*, 221 U.S. 229 (1911); *Fed. Power Comm'n v. Louisiana Power & Light Co.*, 406 U.S. 621 (1972); *City of Altus v. Carr*, 255 F. Supp. 828 (W.D.

- Tex. 1966), aff'd, per curiam 385 U.S. 35 (1966).
17. *Sporhase v. Nebraska*, *Supra.*, note 7, at 3463.
 18. *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970).
 19. 447 U.S. 429, (1980); see also, *White v. Mass. Council of Const. Employees Inc.*, ___ U.S. ___, 103 S.Ct. 1042 (1983); *Hughes v. Alexandria Scrap Corp.*, 426 U.S. 794 (1976).
 20. *Reeves Inc. v. Stake*, *Supra.*, note 19 at 444.
 21. 325 U.S. 761, 769 (1945).
 22. *Id.* at 764.
 23. *Sporhas v. Nebraska*, ___ U.S. ___, 102 S. Ct. at 3456, "The negative implications of the Commerce Clause, like the mandates of the Fourteenth Amendment, are ingredients of the valid state law to which Congress has deferred. Neither the fact that Congress has chosen not to create a federal water law to govern water rights involved in federal projects, nor the fact that Congress has been willing to let the states settle their differences over water rights through mutual agreement, constitutes persuasive evidence that Congress consented to the unilateral imposition of unreasonable burdens on commerce. In the instances in which we have found such consent, Congress' 'intent and policy to sustain state legislation from attack under the Commerce Clause' was 'expressly stated'." Citing *New England Power Co. v. New Hampshire*, 455 U.S. 331 (1982), (Quoting *Prudential Ins. Co. v. Benjamin*, 328 U.S. 408 (1946)).
 24. H.B. 1010, (98th Congress 1st Sess'n 1983), Section Ten of the Act Provides:

Sec. 10. Notwithstanding any other provision of this Act or any other Federal law:

(a) Neither the United States nor any person or entity shall reserve, appropriate, use, divert, dedicate, export or otherwise claim or exercise any right or interest in water within any state for a cold pipeline unless such reservation, appropriation, use, diversion, dedication, export, or claim takes place pursuant to the substantive and procedural law of that state.

(b) Pursuant to the Commerce Clause in Article I, Section 8 of the United States Constitution, the Congress hereby expressly delegates to the states the power to establish and exercise in-state law, whether now in existence or hereafter enacted, terms or conditions (including terms or conditions denying or terminating use) for the reservation, appropriation, use, export, or diversion of or other claim to, or exercise of any right in, water for a coal pipeline, notwithstanding any otherwise impermissible burden, which may thereby be imposed on interstate commerce.
 25. Utah Code Ann. §§73-1-5 to 73-1-7 (1953).
 26. *Clark v. Nash*, 198 U.S. 361 (1905); see generally, 6 *Clark, Water and Water Rights*, §§18 (1972).
 27. *Kaiser Steel Corp. v. W.S. Ranch Inc.*, 81 N.M. 414, 467 P.2d 986 (1970); see also, *Head v. Amoskeag Mfg. Co.*, 113 U.S. 9 (1885).
 28. *Hawaii Housing Authority v. Midkiff*, ___ U.S.L.W. ___, decided May 30, 1984.
 29. *Supra.*, note 28.
 30. *Sporhase v. Nebraska*, *Supra.*, note 7.
 31. Utah Code Ann. §73-7-8 (1953); *Tanner v. Bacon*, 103 Utah 494, 136 P.2d 957 (1943); *Big Horn Power Co. v. State*, 23 Wyo. 271, 148 P.2d 1110 (1915); *Young and Norton v. Hinderlider*, 15 N.M. 666, 110 P.2d 1045 (1910); *East Bay Municipal Utility Dist. v. Dept. of Pub. Works*, 1 Cal.2d 476, 35 P.2d 1027 (1934); *City of San Antonio v. Texas Water Board*, 407 S.W.2d 752 (Tex. 1966).
 32. 16 U.S.C. §§1271-1287 (1974), Wild and Scenic Rivers Act; Or. Rev. Stat. ch. 538 (1979); Utah Code Ann. §73-6-1 (1980).
 33. *St. Dep't. of Parks v. Idaho Dep't. of Water Admin.*, 96 Idaho 440, 530 P.2d 924 (1974); *Day v. Armstrong*, 362 P.2d 137 (Wyo. 1961). See also *Southern Idaho Fish and Game Ass'n v. Picabo Livestock, Inc.*, 96 Idaho 360, 528 P.2d 1295 (1974), which upheld a state statute creating a public easement in a navigable stream, up to the high water mark for all uses for which the stream is suited, including boating, swimming, hunting and fishing; and, *Ritter v. Standal*, 98 Idaho 446, 566 P.2d 769 (1977), where the court held that a private appropriator could not block the public easement in a navigable stream and ordered the removal of a fish hatchery that was blocking public access to an estuary of the Snake River and thus access to riparian lands.
 34. Utah Code Ann. §73-1-3 (1953); *Deseret Livestock Co. v. State*, 110 Utah 239, 171 P.2d 401 (1946); R. Dewspun and D. Jensen, *State Laws and Instream Flows*, Biological Services Program of the Fish and Wildlife Service, U.S. Dep't. of Interior (March, 1977).
 35. Utah Code Ann. §73-3-8 (1976). This section provides for appropriations of limited duration and are limited to appropriations for industrial, power, mining development and manufacturing purposes. This type of appropriation could be expanded to include other beneficial uses. The water right created under this provision is a short-term vested right instead of a perpetual one, but while in force, it is entitled to full legal protection. See generally, E. Clyde and D. Jensen, *Administrative Allocation of Water Resources*, Report to the National Water Comm'n, NWC-L-71-028 (1971).
 36. Utah Code Ann. §73-3-3 (1953).
 37. Utah Code Ann. §73-3-23 (1953); *Wayman v. Murray City Corp.*, 23 Utah 2d 97, 458 P.2d 861 (1969); *City of Roswell v. Reynolds*, 86 N.M. 249, 522 P.2d 796 (1974); *City of Albuquerque v. Reynolds*, 72 N.M. 428, 739 P.2d 73 (1963); *City of Colo. Springs v. Bender*, 148 Colo. 458, 366 P.2d 522 (1961).
 38. *Reeves Inc. v. Stake*, 447 U.S. 429 (1980).
 39. See generally, E. Clyde, *Allocation of Water for Resource Development*, 14 Nat. Resources Law. 519 (1981).
 40. *United States v. Twin City Power Co.*, 350 U.S. 222 (1956); *Federal Power Comm'n v. Niagara Mohawk Power Co.*, 347 U.S. 239 (1954); *United States v. Gerlach Livestock Co.* 339 U.S. 725 (1950).
 41. *Sporhase v. Nebraska*, ___ U.S. ___, 102 S.Ct. 3456 (1982).
 42. *Id.* at 3463. cf. *Arizona v. California*, 373 U.S. 546 (1963).
 43. *Id.* at 3463.
 44. *Id.* at 3463.
 45. See e.g., *Ivanhoe Irr. Dist. v. McCracken*, 357 U.S. 257 (1958).
 46. See generally, *United States v. Cappaert*, 426 U.S. 128 (1978).
 47. *Release, Back to Basics — Taking the Politics Out of Water Law*, (1979) (unpublished manuscript on file with the author).

GROUP THREE:

MARKETS FOR WATER

The term “marketing” seems new to many lawmakers and citizens, and there has been much confusion about exactly what it means. In one sense, water has always been “marketed”; many end-use consumers pay for delivered water. Municipalities, irrigation districts and other entities market water in a limited sense. Generally, however, the sale of water covers the collection and delivery of the water and does not reflect any value of the water itself. Current marketing proposals entail selling or leasing the water itself, rather than simply allowing a potential customer to claim the water and withdraw it free of charge.

The Select Committee faced a dual challenge: how to prohibit or restrict certain transfers of water out-of-state; and how to sell or lease for a profit, water that might be desired by out-of-state users. Achieving both objectives simultaneously was difficult: one goal assumes that there is surplus water while the second goal assumes that water is scarce. It may be that water is scarce because it is free and becomes surplus when it costs something. The irony is that Montana wants to sell surplus water to outsiders in order to construct edifices that continue to supply water to Montanans for free.

The following group of papers focuses on the “practical” aspects of water marketing, but first let us consider the “ideal” marketing scenario for Montana:

- there is enough water to meet reasonable expectations of future needs in Montana;
- the water is taken at the state’s border, thereby protecting instream flows in the state;
- the impoundment and/or diversion system costs are charged to someone else (e.g., federal dams);
- people interested in exporting Montana water must buy it, because they would be unable to obtain a water right;
- Montana can sell water to others without pricing its residents out of the use; and
- Montana can lease water exports provisionally, in order to recall them if conditions change.

Because the ideal marketing scenario is unlikely to occur, there are problems and risks in attempting to market water to out-of-state uses. The papers address these concerns and provide commentary on ways in which Montana could receive revenues from water marketing.

Finnie

Bruce Finnie’s comments address a general question and a specific question. He refers to the nature of a general market for water and to the specific opportunity for the state to sell water to a certain class of industrial users. In the general sense, he argues, there is no market for water in the state because most demands can still be met through appropriations. In addition, as long as ownership or title is unclear there seems to be little incentive to purchase a right to use water.

In Finnie’s opinion, no industrial purchasers of Montana water currently exist nor are there likely to be any in the near future. Demand for western coal to generate electricity has declined because of higher prices, regulations that will require scrubbing for emissions from low-sulfur coal, and economic stagnation. Finnie explains how expectations of massive coal conversion facilities were based on exaggerated forecasts of coal use. He foresees no slurry lines operating within the next decade because of the low market demand for coal and the many obstacles facing the approval and construction of a slurry line. Other users cannot pay enough to justify setting up a marketing program. Finnie does, however, provide guidelines for water policy should a market for industrial water uses develop.

Frank, Beattie and Taylor

The Frank, Beattie and Taylor study attempts to clarify some assumptions concerning the possible sale of Montana water to prospective out-of-state users. The study does not conclude that water marketing plans would be a wasted effort, but it does raise several issues that the state needs to consider. First, the out-of-state market demand might be overstated. Second, the value of water varies tremendously among uses and among geographical situations. Consequently, prospective buyers might switch to alternative sources if the transport costs of Montana water become too high. Third, the state should cautiously analyze water marketing proposals to insure that costs of collection, storage or delivery do not result in the state losing money on the transaction. Fourth, the state should be willing to sell water at a lower value within the state than outside the state because of the indirect benefits from the use of water within the state’s borders. Fifth, there are many types of transactional costs — legal, administrative and other — that ought to be subtracted from the sales price to calculate net benefits.

Thompson

Bob Thompson’s paper discusses the legality of a severance tax on water to generate revenues for the state. He believes that a severance tax could be tailored to address out-of-state diversions while protecting existing Montana users from increased water costs. This could be accomplished by differentiating among uses, industrial versus agricultural for example, or by exempting water uses up to a certain level to protect smaller water users.

The severance tax is usually associated with the mining of non-renewable minerals and resources with the premise that the state needs some compensation for the depletion of its resources. It can also be used, in combination with other regulatory measures, to discourage large-scale “mining” of Montana’s water resources.

SUMMARY:

VALUE OF WATER

The papers in this group explore some of the market assumptions that require attention and clarification, but they do not offer much help in suggesting how Montana should actually price its water, both to maximize the generation of revenue and to provide price differences that protect in-state users from rising prices.

The water marketing study has provoked considerable thought on the value of water. Different groups of Montanans have different estimations of the value of water. If one relied on speeches about water to judge its worth, we could say that it is priceless. If one had to infer from some of the state's actions regarding water, we could say that water is worthless. The true measure of the value of water is yet to be determined.

Water is generally regarded as a "free" resource; it is part of the public domain that, for the most part, can be used without charge.

"Without charge" does not mean that it can be put to use without cost. The amount of water that will be withdrawn for consumption depends upon the cost of building systems of diversion, storage, distribution or purification. There may be growth in irrigated agriculture, population, or commercial activity until a stream is fully claimed, but the primary limits on the use of water are associated with the costs of using it, not on some estimation of the water's value in its natural state.

A zero value for water is sustained until the stream flows are exhausted by withdrawals. Only when scarcity prevails does the water assume an intrinsic value. If a farmer or rancher wants to irrigate more land but there is no more water available, the task might be accomplished by spreading the water more efficiently — by conservation. Thus, one can argue that the capital costs of conservation become the measure of the intrinsic worth of the water. Water is assigned a value when the demand exceeds the supply.

People are not free from constraints on the use of water. For example, water cannot be wasted through excessive irrigation nor can wastewater be returned to the detriment of the water that flows in a stream. But there is still no fee associated with the physical removal of the water from a stream.

Recently Montana joined other states in deciding that there is a non-commercial value associated with stream flows. Instream flows are necessary in order to maintain fish and wildlife habitat and to maintain water quality. Water withdrawals can therefore be limited by calculating the ecological value of a stream flow. Under this system, however, there is no severance fee approach that would reflect costs of withdrawing increments of water from a stream before it reaches the threshold level required for fish and wildlife.

The idea of reserving instream flows stems from the riparian doctrine that is followed in states experiencing greater precipitation. Barge traffic on large rivers, for example, shows how water has a value by simply flowing. A logical extension suggests that people who withdraw water are diminishing this instream value and should be charged for it.

A severance fee would add to the costs of putting water to beneficial uses but would also help deter frivolous consumption. This approach conflicts, however, with the prior appropriation principle that those who are first to claim the water are entitled to use it in perpetuity for free.

The idea behind water marketing is to find a legitimate way to raise revenue from the sale of surplus water to outsiders while avoiding the prospect of increasing the price of water to existing in-state users. For some resource commodities, such as oil, two-tier pricing systems are created to achieve this goal. When there is strong world demand for the commodity, debate arises over the net economic benefits of dual pricing. If domestic customers are charged the world price, then more of the commodity, oil for example, would be available to sell outside the region at the higher price and the region would benefit from increased revenues.

The same situation does not appear to be applicable to water. The difference is that upstream water owners may be unable to drive up the price of water to downstream customers because the costs of storage are too great. The water must eventually be released and then it can be used downstream for free.

A lower domestic price for water may be justified

until all the surplus is used up. Free water can be used to advantage in agriculture or industry by making that economic activity competitive. Economic activity within the region can be spurred by holding down the cost of indigenous raw material or energy inputs. In fact, we have been using financial subsidies to promote domestic water use for years because it is considered economically irrational to let the resource flow by unused. Artificially driving up the price of water might reduce local economic activity and deliver more water at the state's borders for others to use downstream.

There is further confusion over the economics of water for the various beneficial uses allowed under Montana law. For example, agriculture fears the marketing of water because it cannot compete if industry were to bid up the price. Agricultural interests often hope to prevent industry from acquiring water even when the industry would be willing to pay something for the water, above the capital costs of using the water. In reality, agriculture cannot presently afford to make full use of free surplus water because of the capital costs of moving the water to crops.

Montana cannot price its water without knowing how much of it is surplus and how much that water could be worth to outsiders. If there is surplus water leaving the state, then it might be sensible to charge prospective users. But, the fact that it is surplus means that we already treat its commercial economic value as zero. Why would prospective buyers pay for water that they might be able to claim for free, either in Montana or after it has flowed out of the state?

The premise of water marketing thus defies conventional economic logic. A partial answer may be that water users often prefer to buy water from a federal or state storage facility. Paying for the withdrawal from

a reservoir is frequently cheaper than establishing a claim that has to be perfected by creating new storage. Or, there may be locational advantages associated with diverting water from reservoir or stream in Montana that make a water purchase economical when all costs are considered.

An additional complexity involves state sales of water stored in a federal reservoir. It is assumed that the annualized federal costs of construction, maintenance and externalities have been met. The presumption then is that Montana is rightfully entitled to the revenues from these sales since federal dam construction provides deferred benefits, including flood control, for downstream states at the expense of lost agricultural land within the state.

Success in the marketing of headwaters would diminish downstream flows, and could prompt downstream states to force an equitable apportionment of the water. Because out-of-basin or out-of-state sales of water would establish a precedence for water use in the Missouri River Basins, downstream states are more likely to react negatively to these sales than to proposals for expanding in-state consumptive uses in the upstream states. Some people stress the unique property of water as crucial to life itself. Other people think of water for its commodity value and the variety of economic purposes it can serve. Still others think of water as part of a balanced environment and believe in the indivisible ecological benefits of lakes and streams. Some of these views treat water as water *per se*, equally valuable in all of its uses. Others treat water as having variable value, more useful for some purposes than for others. This collection of viewpoints is what makes the pricing of water difficult.

Bruce Finnie

ELEMENTS OF A WATER-MARKETING PROGRAM

The sale of any commodity must naturally involve at least two parties—a willing buyer and a willing seller. In the water market, there are presently no buyers. There are also no sellers with undisputed claim to either the water itself or the right to sell the use of the water for

any purpose.

There is no true water market in Montana today because there is no true market demand. The Montana situation is unlike many other areas in the West where municipal growth is very rapid, the value of agriculture

production much higher, and the relative storage capacity lower. That is not to say that there are no demands on Montana water, but rather that these demands are often nonmarket in nature. Buying and selling water, however, is different than buying and selling shoes, automobiles, or wheat. In those private market transactions, buyers and sellers cooperate to each other's advantage. There is no dispute over ownership whereas there is clear dispute over the ownership of Montana water.

Storage capacity has generally developed as a public good, defined as that type of good that would typically not be produced within the private market system because of the enormous expense involved. Fort Peck and Yellowstone dams provide two good examples. While obtaining the benefits of private goods is predicated upon purchase, the benefits from public goods accrue to society from their very existence. In the case of a pure public good, no one's satisfaction is supposed to be diminished by the satisfaction gained by others, and it is not possible to appropriate a public good for an individual's personal use, as is the case with ordinary goods. Theoretically, perfect competition in the private market leads to under production and under consumption of public goods. In other words, the private market would not have developed the mainstream reservoir system and the resultant flood control and recreational benefits associated with those projects. These benefits cannot be sold to private buyers, which leads to what economists call the free-rider problem. The recipients act rationally and will understate the value of the benefits knowing full well that they will obtain it "free" even though it is certainly not free. On other occasions, those who benefit will deliberately overstate the value of these nonmarket elements (irrigation, recreation, fish and wildlife, water quality, etc.) in order to get new projects built, but built at considerable public expense. And yet in other situations, there are groups who believe that they are adversely impacted by such projects and attempt to stop development using fundamentally the same tactics as those who would see new projects built.

In the private market these sorts of complications do not exist; that is, there is cooperation and mutual benefit. Those benefits, of course, do not explicitly include nonmarket considerations. Additionally, the total level of benefits is restricted by the expense that cannot be borne by individual buyer. In the public market, however, there is no need for buyer cooperation as long as the seller (the public) assumes the cost. Just as pure competition will lead to an under-allocation of public goods, realistically public regulation without cost constraints will result in the opposite misallocation. As a result, any reasonable allocation of water, which has other private and public attributes, should be made on the basis of a reasonable mix of public and private decision rules.

The Problem With Water

The concern over water use in Montana is rather straightforward; farmers and ranchers are afraid of losing their water to industrial developments, which could pay nearly any price. Since energy development must have a firm water supply, the water debate is narrowed to sales from state and federal projects. At the present time, however, there are no industrial buyers nor are there likely to be any in the future. The only possibility appears to be synfuel development, which is at best a long-shot. Farmers and ranchers still have a legitimate concern since the oil picture could change overnight and either the state or federal government could find itself with no alternative but to sell to industry. The demand for energy becomes the focal point of debate.

Energy Demand

The demand for industrial water is almost exclusively tied to the demand for coal, which is fundamentally linked to the demand for electricity. Coal has very little use but to be burned and that process requires cooling water. Coal slurry also requires water.

Starting in the mid 1960s, energy companies began to view western coal development prospects as a source of tremendous profit potential. During that period, electrical load growth throughout most of the nation averaged 5 percent to 7 percent per year, a doubling of demand every ten to 15 years. Today, the projected rate of growth is approximately 1.5 to 2.5 percent.

The assumed rate of growth for electrical loads greatly affects the forecasted amount of Montana coal to be mined. John Duffield *et al.* (**Northern Great Plains Coal Demand Study**, 1982) estimated that a 1 percent difference in annual load growth results in a 40 percent difference in northern Great Plains (Montana, Wyoming, North Dakota) coal production by the year 2000. Furthermore, over the past decade Montana's prime market area (the Midwest) experienced population growth approximately one-half of the national norm. Given the industrial composition of that region, it is probable that overall load growth will be less than the national norm in the future.

Another determinant of the market for Montana coal is federal and state policy governing the amount of sulfur dioxide that coal-fired power plants can release into the atmosphere. In 1971, Congress amended the Clean Air Act to set New Source Performance Standards, which allowed 1.2 pounds of sulfur dioxide to be emitted for every million BTUs of coal burned by a plant. Some of the low-sulfur coal mined in Montana and Wyoming could be burned without using flue gas desulfurizers (or scrubbers) and meet the standards. Because it is less expensive for some plants to install coal blending facilities to burn low-sulfur coal than to retrofit existing plants with scrubbers, demand for low-sulfur Montana coal increased from 7 million tons in 1971 to nearly 33 million tons by 1979. In 1978, more stringent emission standards called Revised New Source Performance Standards (RNSPS) were established. Because even low-sulfur coals required some scrubbing under the RNSPS, demand for Montana coal declined. Pollution control legislation helps to explain why Montana coal production has been stagnant for the past five years.

Coal mined in the Northern Great Plains (NGP) region increased from 15 million tons as late as 1976 to 96 million tons in 1979. This amount represented 50 percent of the incremental increase in coal production for the entire United States. In spite of this increase, the market for NGP coal is presently soft with little improvement likely for the next 10 years. Because expected increases in the amount of marketable NGP coal did not materialize, industry overcapacity in Wyoming exceeds 50 million tons; it is approximately 25 million tons in Montana.

Presumably Wyoming could compete formidably with Montana if unanticipated increases develop in market demand for NGP coal. Wyoming may be better able to satisfy demands because of 1) higher idle production capacity, 2) the possibility of substituting Wyoming coal for Montana coal due to common British Thermal Unit (BTU) and low-sulfur characteristics, and 3) a lower delivered price of Wyoming coal, particularly if rail competition develops between the Chicago and Northwestern/Union Pacific railroads, and the Burlington Northern (BN). This hypothesis appears to be borne out by the recent Northern States Power purchase of Wyoming coal from the Rochelle Mine (Coal Week, April, 1984) for use in Minnesota. In the past, Minnesota would definitely have been within Montana's market area and not Wyoming's.

Consistently, the old forecasts were too high. For example, Montana coal demand projections made by the Montana Department of Natural Resources and Conservation (DNRC) in 1976 were calling for 325 million tons by 2000, a level that is probably over three times what the actual level will be. During that period eastern Montana was bracing for an expected economic/demographic shock wave from potentially dozens of generation facilities, synfuel plants, and slurry

lines. Most analysts were projecting explosive energy/economic growth. If this had not been the case, the current prohibitions against industrial water use, the Montana Major Facility Siting Act, and the coal severance tax would not have been enacted to control such growth.

Some reasons why the forecasts were too high were that both corporate and public analysts assumed that oil prices would continue to increase and remain high relative to other prices, that air quality regulations would continue to favor western coal, that the demand for electricity would continue to grow at historical rates, and that increased prices for electricity would not affect the level of demand.

Estimates of electrical load growth (and hence coal and water demand) ignored the effects of increases in the cost of providing that energy. High rates of inflation resulting from an expansive federal monetary policy and falling productivity during the 1970s drove up the costs of both plant construction and borrowing. As a result, the cost of providing energy increased. This increase in the price of energy had a pronounced effect on consumer demand and, therefore, the rate of load growth.

As a result of most energy planners' insensitivity toward these price effects, many utilities (both public and private) developed capacity well beyond realized demand levels. By 1980, it became apparent to most utilities and public service commissions that excess capacity existed beyond reasonable levels. Utilities began to postpone construction and regulatory agencies began to question seriously adding new capacity to the rate base. All of these events sharply reduced the demand for coal and water.

The Slurry Issue

Coal and transportation currently account for about 35 percent of the annual cost of generating electricity in a new plant. The delivered cost of fuel to existing plants constitutes a considerably higher proportion of annualized costs because debt service is less for older plants constructed when both interest rates and construction costs were lower. Fuel and transportation costs in a Midwestern plant constructed ten years ago may be as high as 50 percent of annual generation costs (i.e., 25 percent coal and 25 percent transportation expense). This fact emphasizes the significance of transportation costs to future growth in Montana's coal production. High Montana rail rates will diminish Montana's potential market, which is not strong to begin with.

While the BN has excess capacity and can probably underbid slurry lines, if the BN continues to increase rail rates at or near the pace of the past few years, then slurry pipelines will become an increasing competitive threat. Although the pro forma rate of return on equity for slurry lines seems generally attractive (i.e., low 20s range), there is a great deal of risk associated with large-scale energy projects. Default of the nuclear utility bonds issued by the Washington Public Power Supply System, the failure of the Northern Tier Pipeline and the synfuel program, and potential rate base problems with Colstrip Units 3 and 4 will weigh heavily on investors' minds.

The largest single obstacle to slurry development rests in the comparatively recent shift from short- to long-term rail contracts. Within the past five years, the duration of the average rail contract has increased from a few years to nearly 20 years. These contracts cannot be broken, so the BN has in effect cornered the existing coal transportation market regardless of slurry costs. This long-term commitment implies that the success of slurry is limited to new coal demand. The demand for new coal from Montana is not likely to increase by more than 30 million tons by 1990, an amount of coal which could be moved by one pipeline. This new tonnage could also be moved by existing BN rail capacity.

A second fundamental constraint facing the development of a slurry line is sales timing. A project has to operate at nearly full capacity for both engineering and financial reasons. New power plants are generally sized at about 350 MW, and would require about 1.8 million tons of coal per unit per year. This requirement implies that a slurry line carrying between 20 to 30 million tons per year would serve at the minimum between 11 and 17 typical power plants or two to three energy complexes the size of Colstrip. The problem is that it is very unlikely to find that many old plants that are switching to Montana coal on a new contract, or that much capacity under construction at the same time. Railroads can add to capacity as needed. A slurry operation has to build and sell all capacity at one time.

Eminent domain is a problem for coal slurry pipelines, which must be built across several states and must comply with different state laws. Although a federal eminent domain law would facilitate slurry construction and help reduce pipeline costs, it is not an absolute necessity as long as the pipeline company can obtain easements from all landowners along its route. The potential problem that a pipeline faces is not being able to get easements from one or more landowners no matter what price is offered. Without the power to condemn right-of-way, constructing a slurry line is more costly, time consuming, and may be impossible in some states.

The water required to transport all new export coal through the year 2000 could not exceed 10% of current unallocated storage within the coal-producing region of

Montana. Some individuals, however, do not believe water availability presents a problem for slurry development. They suggest the use of oil or distillates as a transport medium, but either would be extremely expensive—several hundred times the cost of water. The use of such media would probably not be financially viable unless the facility were designed as a joint coal/oil pipeline, where oil transport was a primary source of revenue.

Based on what appears to be limited demand for Montana coal, excess rail capacity, and a variety of marketing problems for potential slurry, it is my opinion that there will be no slurry lines operating in Montana for at least a decade. If such a line is developed it is even less likely that Montana water would be used in light of public opinion and probable complications with the Yellowstone Compact. Furthermore, in view of the recent ETSI decision (*Missouri v. Andrews*, May 3, 1984), it is possible that no federal water will be used, essentially precluding slurry pipelines altogether.

Other Energy Demand

Rail and slurry lines are not the only means of transporting power. In the Montana experience with energy development (Colstrip Units 3 and 4 Environmental Impact Statement) much, if not most, of the debate focused on the need for power within Montana as opposed to that in the region served by the Bonneville Power Administration (BPA) grid in Oregon, Idaho and Washington. The plants were built, but several issues have not been resolved, including one which is important to the potential demand for industrial water sales within Montana. That issue is: can an out-of-state utility build a plant in Montana to export the power and comply with the "need" criterion required by the Major Facility Siting Act?

This issue, while unresolved, will be remembered by both actual participants as well as other utilities within the region. Interviews with two major out-of-state utilities that participated in Colstrip Units 3 and 4 indicate that those companies would never consider Montana as a site for additional generation even though they estimated energy costs via long distance transmission to be five to seven mills less than local generation with embodied rail transportation costs. Minemouth generation and long distance transmission, therefore, may be far less expensive over time than either rail or slurry costs. Moreover, if utilities' perceptions of siting difficulties are correct, Montana's realized coal

market and resultant water use could be less than expected versus other states such as Wyoming and North Dakota. If siting coal-fired power plants in Montana to export electricity is possible and attractive to utilities, both coal and water use could increase. If the state faced a trade-off between siting generation plants in Montana or encouraging the use of slurry to lower long-term delivered costs of coal, water use could become an important consideration. It takes significantly less water to transport via slurry than to burn an equivalent amount of coal in a plant. Steam generation requires two to four times more water than slurry.

The development of additional coal-fired units in Montana within the next 15 years is unlikely. Furthermore, synfuel development within the Montana market area does not appear to be a realistic development prospect. The synfuel possibility should, nevertheless, be the most worrisome to farmers and ranchers, since a true energy shortage could involve "fast track" joint federal/private developments using federal water regardless of Montana impacts. National priorities could supersede those of Montana's. Federal programs would use federal water, with limited litigation delay. It is, of course, impossible to determine the probability of such an event.

During the next decade, industrial water demand in the Montana market area is expected to be minimal or nonexistent. Agricultural water demand is also expected to be low.

Agricultural Demand

Between 1970 and 1975, there was a significant increase (16 percent) in the number of harvested irrigated acres in Montana. The early 1970s, however, were good grain and cattle years. Since 1975, the number of irrigated areas has remained essentially constant, averaging approximately 1.7 million acres or about 19 percent of the total acres in production. The value of irrigated crop production is usually about 30 percent of the total Montana production value versus 50 to 90 percent in other western states. This difference probably reflects the fact that the value of crop production (on an acre basis) is generally higher in other areas of the west than in Montana.

Agriculture is far and away Montana's biggest water user. The DNRC estimates that agriculture uses approximately 82 percent of water consumed in Montana versus 17 percent for reservoir evaporation, one percent for municipal and rural domestic use, and less than one percent by industry.

Ability to Pay

The core of the water debate in Montana can be expressed as one basic question: To what extent do Montanans want water to flow to its highest economic use? If the recent Montana Futures survey (Department of Sociology, University of Montana, 1984) is any indication, most Montanans rank agricultural, residential, and recreational uses well above industrial use. Additionally, this survey indicates that Montanans believe (by a 2 to 1 margin) that Montana should not sell water to other states.

If an actual market existed for stored water in Montana, and if these rights were freely transferable, water would move to its highest economic use, the exact reverse of the ranking found in the Montana Futures survey.

Although it is difficult to measure precisely the full value of water to agriculture, the Montana studies that the author is aware of place that value between \$20 to \$50 per acre-foot; the average value is approximately \$35 per acre-foot. That figure, however, includes operator profit. Most current water users (state projects) pay less than \$10 per acre-foot. In view of past, current, and probably future farm profitability, it is my opinion very few farmers and ranchers would be able to pay over \$15 per acre-foot for water.

Cities and towns can afford to pay more than agriculture since municipal water is a necessity. Water could be argued to be a necessity for agriculture, too; however, the municipal situation is different in the sense that cities and towns can simply increase taxes (or fees) to pay for new projects. The cost of new wells will typically fall in the \$50 to \$100 per acre-foot range. Piping and pumping costs may double or triple that figure. Therefore, a \$200 acre-foot figure is probably reasonable for comparison with agriculture.

The price that industrial users will pay varies among technologies. Deep, high volume well costs will average \$200 per acre-foot. Wells, however, are not likely to be a viable alternative to stored water because of potential water quality or groundwater depletion problems. If industry were to move large volumes of water (+ 20,000 acre-foot) from, for example, Yellowstone to the coal-producing area (Decker), distribution costs would be approximately \$500 per acre-foot. A price above \$1,000 to \$1,500 per acre-foot would probably result in a change in cooling technology for an electrical generation facility (i.e., the process would use less water). Little is known about how much a synfuel plant

would pay; nevertheless, we do know that slurry developers will pay dearly. The ETSI contract with South Dakota suggests a range of values (\$200 to \$500 per acre-foot) plus distribution costs which may be as high as \$2,500 per acre-foot. For comparison, a recent study conducted for the DNRC indicates that the water costs (at \$500 per acre-foot) for a large slurry pipeline (36 million tons) would be approximately 2 percent of total costs. Furthermore, profitability does not seem to be significantly affected by water price.

Cost of New Water

It is fortunate that Montana has the luxury of dealing with comparatively large amounts of unappropriated water. Unfortunately, the state of Montana owns

approximately 15 facilities that by federal standards are considered to be unsafe. Additionally, the state is liable for damages. It is estimated that it will cost between \$300 to \$500 million to repair these projects. On an annual basis, project costs will typically run \$50 per acre-foot for rehabilitation and between \$150 and \$300 per acre-foot for new storage capacity. Agriculture obviously cannot afford these rates. Without industrial or municipal sales, these new projects are generally infeasible. If there were a market, however, industrial sales could help rebuild these projects.

As a result of increased construction costs and rising interest rates, the cost of new storage has probably tripled if not quadrupled within the last decade. Many of the newer projects are heavily subsidized. The games played by economists and engineers in building up benefit/cost ratios with nonmarket benefits have become notorious. While those intangible benefits (recreation, water quality, irrigation, and flood control) are important, there comes a time when the real prices of these projects should be considered. Both the taxpayer backlash and impact of unproductive investment on the private market have to be realized, particularly when there is no shortage of water.

CONCLUSIONS AND RECOMMENDATIONS

The water crisis that was expected to occur this decade has not taken place, nor will it. Those old projections (300,000 to 600,000 acre-foot) of sales did have an influence on Montana's ability to market water; the state's ability is simply banned, even though no market exists.

Before industrial markets do develop, this deadlock should be broken. This will be difficult given the number of parties and issues involved: farmers, ranchers, industry, environmental concerns, multiple states, the Tribes, and the list goes on. If this deadlock can be

broken, the following tendencies and guidelines may be of some value in setting water policy:

- 1) Since the issue focuses on stored water and since nearly all storage is public, private markets, while appealing, may have limited relevance.
- 2) We are dealing with only two sellers operating as spatial monopolies. Montana farmers and ranchers, even in a surplus situation, have a legitimate concern over what these monopolies might do.
- 3) The historical ability of agriculture to purchase

from the state or federal government should be maintained in perpetuity. Purchases beyond the current level should not be subsidized.

- 4) The state should establish reasonable minimum reservoir levels to ensure that the noncommodity value of water is maintained, before industrial sales can take place.
- 5) The state should establish the level of potential industrial sales out of each state and federal project.
- 6) Since the authority of the state to sell industrial water is questionable, the state may wish to consider taxing industrial water use, an approach which is less questionable.
- 7) Tax proceeds, if any, could be used to help rehabilitate unsafe projects.
- 8) Given the high cost of new capacity, and the inability to pay for such capacity, it would be very unwise to build projects until there is real demand.

These suggestions will not be well received by individuals who are against state water marketing on philosophical grounds (e.g., reduce coal growth by eliminating slurry). The mere existence or potential of a slurry line is not tantamount to an increase in the coal industry. Montana, however, should definitely not ignore the fact that nearly 20 percent of the statewide growth during the 1970s resulted from coal mining and related activity.

Slurry lines may never be built, nor do they have to use Montana water even if they are built. Synfuel development and future electrical generation projects would use Montana water. While there is clearly no electrical shortage, the oil market could change next week. Flexibility should be built into any state water program that would allow such change to occur without losing control. Fast-track private development of industrial storage or federal sales would probably not maintain the type of control that most Montanans apparently want to see.

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ECONOMICS OF WATER-MARKETING OPTIONS FOR MONTANA

The idea of water marketing is fairly straightforward from an economic perspective. Finding political consensus and developing an operational water marketing plan is another matter. From a purely economic viewpoint, it makes sense to market "Montana water" if the benefits (broadly defined) to Montanans exceed the costs (broadly defined) to Montanans. A key, of course, is correctly identifying

and estimating all the benefits and costs to make a reasonably accurate benefit/cost calculation. As with all matters of public policy, this is easier said than done.

For purposes of this paper, we consider the following chart of relevant and not relevant categories of economic benefits and costs to the state of Montana from the sale of water for in-state and out-of-state uses:

Economics of Water Marketing

Benefits:	In-State Sale	Out-of-State Sale
(1) Receipts from sale (net value of water to user)	Yes	Yes
(2) Increased net income to Montanans from economic activity due to investment of receipts from water sales	Yes	Yes
(3) Increased net income to other Montanans from economic activity due to increased use of water in the state	Yes	No
Costs:		
(1) Opportunity value of water if not sold (e.g., value of water in storage or instream, but not presently used) for present or future use	Yes	Yes
(2) Costs of running a water market (administrative costs, attorney's fees, etc.)	Yes	Yes
(3) Costs of capture and storage	Yes	Yes
(4) Costs of transporting water to user (if part of the deal)	Yes	Yes
(5) Foregone opportunity for item (3) under benefits if out-of-state sale	No	Yes

To make the best possible judgment about whether or not Montana should undertake water marketing, we need knowledge about all the benefits and costs listed above. Of course, it must be recognized that in a world of political and economic uncertainty and imprecise economic science, the reliability of these estimated benefits and costs is not as great as we would like.

This report may shed light on the question: Will water

marketing be beneficial to Montana? The report focuses on what is known about the value of water to water users and addresses ways that Montana might increase receipts from water marketing if water marketing is undertaken. In the conclusion we offer our professional opinion on a number of matters pertaining to water marketing, recognizing that much information is still needed.

VALUE OF WATER IN ALTERNATIVE USES

Considerable research has been involved in determining the value of water in each of its varied uses. These uses may be classified in four major categories: agricultural, industrial, municipal (residential), and recreational. The relative value of water in each of these will be discussed.

All values have been converted to 1980 dollars so that comparisons among studies and uses may be made. Also, all values are values-in-use: they pertain to a

specific use in a specific location. Thus, when comparing any two values, the cost of transfer between the two locations needs to be considered. For instance, if the values-in-use for states A and B are \$10 and \$15 respectively, a transfer (sale) from A to B is not feasible unless the cost of transfer (both the cost of moving the water plus any administrative costs) is less than \$5. Otherwise, the overall cost of the delivered water will exceed its value-in-use in state B. Such values-in-use for

each major use of water are discussed in the following sections, which draw importantly from Young and Gray. All values are reported in per-acre-foot terms.

Irrigation Water Values

Irrigation water values from selected studies are presented in Table 1. Not surprisingly, these values vary considerably. For instance, the relatively low value of \$4.97 reported by Sorenson and Clark represents the value of water when used to irrigate meadow (a relatively low-value agricultural use). The highest value of \$81.20 corresponds to the discounted value of a permanent transfer of a water right from irrigator to

irrigator at \$1,624 per acre foot, assuming a five percent real discount rate. This value reflects both the seniority of the transferred right and certainty in delivery of the water, and thus includes a risk premium. Therefore, the \$81.20 value probably overstates the typical value of irrigation water in the area.

Also note that the values reported for the same region differ somewhat. For instance, Anderson reported a range of values from \$8.97 to \$12.44 in the Sevier Basin. However, values derived from Weatherford's water rights values range from \$25.38 to \$40.60. Such differences may be due largely to increased competition for these rights by electrical generation facilities.

The values of water in Montana reported by Frank and Beattie represent an aggregate value for the entire upper Missouri Basin (including the upper Missouri and the Yellowstone river basins). Peel's somewhat higher value of \$59.50 corresponds only to the Yellowstone River Basin — an area of relatively fertile soil and higher value crops. The value of irrigation water in the Yellowstone Basin is expected to be higher than the aggregate value. Moreover, Peel's estimate includes an economic return to management and certain fixed factors. The value of water is actually the \$59.50, less an appropriate charge for operator labor and management and certain fixed factors.

Table 1. Irrigation Water Values (Selected Studies)

Study	Study Area	Value (\$/ac.ft.)
Gardner & Fullerton	Sevier Basin (Utah)	24.44
Anderson	South Platte (Colo.)	8.97-12.44
Sorenson & Clark	East Central Wyoming	4.97-31.05
Lindeborg	Snake River (Idaho)	43.58
Shumway	Salinas Valley (Calif.)	29.45-41.64
Grubb	Texas High Plains	60.29
Beattie	Texas High Plains	51.28
Young	Lower Colorado	42.42
	Texas High Plains	42.42
	Central Arizona	26.79
Hartman & Seastone	Imperial Valley (Calif.)	14.00
Frank & Beattie	Upper Missouri Basin (Mt.)	9.29 ^a
	Northwestern Ogallala	21.39
Weatherford	Sevier Basin (Utah)	25.38-40.60 ^b
	South Platte (Colo.)	15.23-81.20 ^b
Peel	Yellowstone River (Mt.)	59.50

^a Upper Missouri and Yellowstone River Basins.

^b Derived by discounting the value of permanent transfers of water rights reported in Weatherford (assuming a 5% real discount rate).

Table 2. Municipal Water Values (Selected Studies)

Study	Study Area	Value (\$/ac.ft.)
Seidel & Baumann	United States	368.63 ^a
Foster & Beattie	Plains & Mountains ^b	261.80
	Southwest ^c	294.52

^a Mean monthly charge to users.

^b Idaho, Montana, Wyoming, Utah, Colorado, Nevada, North Dakota, South Dakota, and parts of Nebraska and Kansas.

^c Southern California, Arizona, New Mexico, and parts of Texas and Oklahoma.

Municipal Water Values

Municipal water values from two selected studies are presented in Table 2. Notice that the value of water for residential uses varies among regions. For instance, values derived from the reported demand curves in Foster and Beattie range from \$261.80 in the Plains and Mountain regions to \$294.52 in the Southwest. Such values emphasize the relative shortage of water in the more arid Southwest as compared to the Intermountain region. Furthermore, the relatively high average price of water for the entire United States, reported in Seidel and Baumann, suggests that such regional differences are

even more pronounced among all regions in the United States. It is important to emphasize that the values reported in Table 2 are for potable water delivered to residences. A municipal water supply company's willingness-to-pay for "raw" water would be lowered by their anticipated costs of treatment and delivery.

Industrial Water Values

Water values in selected industrial uses are presented in Table 3. Notice that the value of water per acre-foot varies substantially among uses. For example, water ranges from an extremely low \$0.03 for waste water dilution to \$352.15 for cooling.

Table 3. Industrial Water Values (Selected Studies)

Study	Use	Value (\$/ac.ft.)
Russell	Cooling (Power Generation)	6.17-6.95
	Cooling (Sugar Beet Processing)	20.27-23.23
Stroup & Townsend	Cooling (Power Generation)	189.39-352.15
Weatherford	Power Generation	114.83 ^a
Russell	Processing (Sugar Beet)	96.31
Olson	Processing (Steel)	37.14
Berger	Processing (Paper)	74.29
Young & Gray	Water Dilution	0.03-1.25 ^b

^a Derived by discounting the value of permanent transfers of water rights reported in Weatherford (assuming a 5% real discount rate).

^b Projected for 1980.

More importantly, reported water values for a particular use appear to vary dramatically. The value of water for use in power generation cooling varies from \$6.17 to \$352.15. Such differences are due largely to the assumptions of the studies. In particular, Russell assumes that a feasible alternative to replacing the water after cooling is recycling. A minimum value of the recycled water (assuming the value of the heated water is zero) is the cost of recycling. Such costs were calculated to range from \$6.17 to \$6.95. Conversely, Stroup and Townsend assume that the alternative technology would be a dry cooling process. The reported values of \$189.39 to \$352.15 correspond to the water price, resulting in a change from wet to dry cooling towers (given certain conditions). The value of water for cooling in power generation depends largely upon the alternative technology. Interestingly, the value derived from the permanent sale of water rights (as reported in Weatherford) appear to support the higher values.

While the marketing of Montana water for recreational purposes may not be viable, it should be noted that the benefits obtained by marketing water for other uses should be reduced by the value of any lost recreational opportunity in Montana as a result.

Comparison of Water Values Among Major Users

Recreational Value of Water

Although we recognize that water for recreational purposes is a beneficial use, we have not provided use value estimates because we are not aware of any opportunities for marketing Montana water for recreation. The public nature of most water-based recreation, and the relatively ample supply of low-cost or free (to the user) water-based recreation opportunities, make the prospect of marketing water for recreational purposes remote.

A comparison of the range of water values reported for each use shows that water for municipal use has the greatest value-in-use:

Municipal	261.80-368.63
Industrial	0.03-352.15
Irrigation	4.97-81.20

Industrial water has the next highest, with agriculture having the lowest value. These results suggest that agriculture is the marginal user of water. However, due to the relatively low water values for some industrial uses, agriculture may be able to compete with certain industrial uses, such as wastewater dilution.

INDIRECT ECONOMIC VALUE

In the preceding section the reported values represent the direct economic value of water to the immediate user of the resource. The values represent maximum willingness-to-pay on the part of the user. However, from the state's perspective there can be additional beneficial effects from the sale of water — whether to an in-state or an out-of-state user — beyond the selling price. These additional benefits are due to linkages among different sectors of the Montana economy.

For example, if an additional acre-foot of water for

irrigation in Montana is worth \$10 to the irrigator, its value to the state is something greater for two reasons. First, the farmer purchases inputs (e.g., fertilizer and machinery) from farm supply dealers in the state and sells the product to firms that add value before shipping it from the state. In some instances the added value may be due simply to the shipping.

This additional economic activity results in net earnings to companies and labor employed by these firms. Additional earnings by these are in turn spent for

the purchase of inputs, consumption, and other goods and services within the state. Thus, the total net increase in income to Montana residents resulting from the use of additional water can be added to the economic value stemming from water in that particular use. All other in-state water uses would similarly have an indirect as well as a direct economic value to Montana.

The second reason for added economic value from the sale of water has to do with the ripple effects created

in the Montana economy when the state invests the income earned from the sale of water. If water is sold to an out-of-state user, this would be the only indirect beneficial effect because the indirect benefits from the use of the resource would largely go out-of-state. For this reason it would be reasonable for Montana to consider marketing in-state water at a lower price than out-of-state sales.

POSSIBLE ARRANGEMENTS FOR SALE OF WATER

It is commonly believed that most areas of the U.S. now face or will soon face severe water deficits. Because Montana is in one of only a few water surplus regions, the state could have considerable market power in selling water for out-of-state use. The only competition for out-of-state markets for most uses would probably come from neighboring states. If Montana attempts to compete with neighboring states, benefits to the multi-state region could fall; beneficiaries of the competition would be the out-of-state purchasers. Consequently, "compact" arrangements with neighboring states should be examined so that the region can take advantage of market power in selling water to certain classes of out-of-state users.

Another characteristic of water marketing for Montana to consider is that the value of water depends on its intended use and on the quantity of water available for that use. Thus, rather than charging a "flat fee" for all units of water sold, a fee that varied by use could be charged. There appears to be a precedent for this type of price discrimination in the many public water utilities that charge different rates for residential, commercial and industrial uses.

A hypothetical aggregate demand curve for water suggests that as the quantity of water marketed increases, the price that buyers are willing to pay for the marginal (last) unit of water decreases. Without price discrimination, the same price is charged for all units sold. However, to the extent that residential and commercial users are associated with the upper segment of the demand curve and agricultural users are associated with the lower segment of the curve, price discrimination (or block-pricing) can be practiced. That is, some groups of users are willing to pay more for water than other users are willing to pay, permitting

differential pricing.

With or without differential pricing, gross or net returns to the state are not necessarily maximized by selling all available water. This is because the price a particular group is willing to pay decreases as the quantity of water sold to the group increases. Whether or not all available water should be sold depends on the "elasticity of demand" as well as the particular block-pricing scheme. A study by Frank and Beattie showed that the agricultural demand for irrigation water is approximately of unitary elasticity: the gross revenue from the sale of water would not vary appreciably with quantity of water sold, assuming all units demanded are sold at the asking price. However, Sawchuk showed that there was little elasticity in demand for residential and commercial uses. This means that if the price charged is equal to maximum willingness to pay, gross revenue to the seller is maximum with a restricted sale policy. Accurate estimates of the elasticity of demand for Montana's surplus water are needed before a substantive plan for discriminatory pricing and selection of the quantity of water to offer for out-of-state sale can be proposed.

While Montana may have considerable market power as a potential seller of surplus water, potential buyers (especially out-of-state buyers for purposes such as coal slurry) may also have considerable market power. If a buyer or a group of buyers has market power, the appropriate sales strategy for Montana differs from the case where buyers do not have market power. In the case where buyers do not have market power, the seller can obtain the buyers' maximum willingness to pay through an ordinary bidding process; the state does not really need to know beforehand what the buyers are willing to pay.

On the other hand, if the buyer or buyers have market power, ordinary bidding would result in the buyer bidding the “minimum” amount the state would be willing to accept for the water; this price can be substantially below the maximum that the buyer is willing to pay. In such a case, the state could improve its bargaining position by having good information on the potential buyer’s maximum willingness to pay. The negotiated price in such a case would be somewhere between the minimum acceptable price and the maximum willingness to pay price. The exact price will depend on the negotiating strength of the buyers and the sellers.

Other considerations in arranging for the sale, particularly the out-of-state sale, of water include:

(1) Who will transport the water to its site of use or to the state line? Obviously, if Montana engages in the water delivery business, the gross break-even selling price of water will increase dramatically. The capture, storage, and delivery of water is an expensive and risky proposition, except for those facilities already built, such as the Fort Peck Reservoir.

(2) What time should the contract encompass: a single year, perpetuity, or some intermediate length?

(3) Will provisions for inflation be made in the contract?

(4) Should the state allow the initial buyer to re-sell the water to a third party?

(5) Should the state have a provision in the contract to allow it to buy back the water at a specified price?

CONCLUSION

Some observations based on professional opinion (as opposed to empirical evidence) may be of value to the Select Committee on Water Marketing in considering the pros and cons of marketing Montana’s water. In our opinion:

(1) It is reasonable to treat water marketing like marketing of other resources, goods and services. If Montanans can gain more value by selling water than that water is expected to produce in its present or expected use, then it seems reasonable to consider marketing “surplus” water.

(2) The effective demand (that backed up with willingness and ability to pay) for Montana water is likely to be less than popularly believed. The willingness to pay for raw water is decidedly lower than that reflected in demand studies based on value in use at point of use. Inexpensive water is generally more readily available for high-valued uses in distant locations from Montana than popularly believed. For example, agricultural water values are quite low throughout the western United States and most higher-valued demands can be satisfied by diverting rather small amounts of water from agriculture to higher-valued uses in those states. Thus, it is the lower-valued out-of-state uses that more realistically represent the possible effective

demand for Montana water.

(3) Water delivery costs are not insignificant. If Montana decides to market water, it should look cautiously at proposals that would involve investing state dollars in developing or operating transport structures.

(4) Montana should beware of often overlooked transaction costs. Legal, accounting, and bureaucratic costs are real costs that must be subtracted from receipts to get the net value of marketing water.

(5) Indirect or secondary benefits of water development are usually overstated, both those stemming from the water use itself and those due to structural development (construction and operation of water delivery structures).

(6) When a water sale from an existing use to an alternative use is contemplated, it is important that the quantity sold be limited to the consumptive use rather than the diversion right to take into account the return flows. Diversion rights (especially for irrigation) exceed consumptive use by the amount of the return flow, from which a downstream user gains value. Serious consideration of water rights sales must address the problem of return flows.

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A STATE-IMPOSED SEVERANCE TAX ON WATER: AN ANALYSIS OF LEGAL ISSUES

The imposition of a severance tax on water diversions within Montana should be considered by the Montana legislature. In a popular sense, a severance tax on water would be attractive because of the success of Montana's coal severance tax.¹ The coal severance tax has been successful in at least two ways. First, the tax has generated substantial revenue for a variety of local and state programs, including the coal severance tax trust fund created under Article IX, section 5, of the Montana Constitution. In fiscal year 1983, for example, the coal severance tax added over \$82 million to state revenues.² Second, the coal severance tax withstood both

Commerce Clause and Supremacy Clause challenges before the U.S. Supreme Court in *Commonwealth Edison Co. v. Montana*.³

The proven constitutionality of this tax thus serves as a positive rationale for adopting other severance taxes. The Commerce Clause analysis in the *Commonwealth Edison Co.* decision does, however, raise a number of questions regarding the constitutionality of a water severance tax. Answers to these questions have direct implications on the advisability of implementing the tax.

COMMERCE CLAUSE ISSUES CONCERNING A SEVERANCE TAX ON WATER

In *Commonwealth Edison Co.*, the U.S. Supreme Court relied on a four-pronged test originally set forth in *Complete Auto Transit, Inc. v. Brady*.⁴ As stated by the court: "(u)nder that test, a state tax does not offend the Commerce Clause if it 'is applied to an activity with a substantial nexus with the taxing State, is fairly apportioned, does not discriminate against interstate commerce, and is fairly related to services provided by the State.'"

coal severance tax was upheld because the mining of Montana coal can occur only in Montana, thereby eliminating the potential for other states to tax the severance.⁵ Water diversions from points within Montana also seem largely free from dangers of multiple taxation. One consideration, however, is the capability of water to return to its original water body and thereby become available for future diversions either in Montana or in downstream (or down-basin in the case of groundwater) states. This potential for re-use may lead to assertions of multiple taxation, though such waters are arguably "new" resources which are undergoing a diversion distinct from the original diversion.

The Substantial Nexus Requirement

This requirement is a threshold determination that the activity being taxed must have some connection to the state imposing the tax. The mining of coal within Montana was a clearly sufficient nexus for the coal severance tax.⁶ Similarly, the diversion of water within Montana is a sufficient nexus with the state.

The Fair Apportionment Requirement

The fair apportionment concern represents the court's effort to insure that taxes are fairly apportioned and that activities are not exposed to multiple taxation. The

The Evenhandedness Requirement

The third prong of the *Complete Auto Transit* test emphasizes the requirement that taxes must not discriminate against interstate commerce; i.e., out-of-state and in-state users must be treated evenhandedly. In *Commonwealth Edison Co.*, the Supreme Court evaluated the coal severance tax to determine if the rate of the tax was the same for both groups.⁸ The court dismissed the claim that the tax was discriminatory because its actual incidence (burden) was borne by out-of-state consumers. Instead, the court emphasized that the tax burden was borne "according to the amount of coal consumed and not according to any distinction between in-state and out-of-state consumers."⁹

A constitutional severance tax on water must be generally framed to assess in-state and out-of-state consumers at the same rate levels. While this treatment is acceptable to Montanans for coal, it may not be as

desirable for water. In contrast to coal, nearly all the water diverted in Montana is used by persons within the state. Thus, the tax burden from a severance tax on water would fall primarily on in-state consumers. The practical and political desirability of an added tax on a necessary resource for Montana residents is questionable. Therefore, any severance tax proposal would need to contain exemptions to reduce the impact on state residents.

The most direct exemption would involve assessing a tax on out-of-state consumers only. As discussed, the constitutionality of this distinction is doubtful. *Sporhase v. Nebraska ex rel. Douglas*¹⁰ suggests that some laws or regulations may constitutionally discriminate between in-state and out-of-state users if a sound conservation rationale exists. Conservation efforts within the state would be required, however. Unfortunately, a severance tax may receive different treatment under *Sporhase*.

The safest exemption strategy may be one modeled after the exemption contained in the coal severance tax statute. The coal severance tax exempts producers of coal whose mines yield less than 50,000 tons annually.¹¹ A water severance tax could also have an exemption level, which could be selected to exclude most Montana water users from severance tax liability. The exemption could be based on the amount of water either diverted or consumed. The latter measure, provided consumptive use is defined as that water which is not returned to a point near its original diversion, has the advantage of giving favorable treatment to proximate, in-basin users.

Severance tax exemptions could also be written to exempt certain uses, such as agricultural uses, or to apply narrowly to specific populations. For example, the tax could be applied directly to large industrial users, thereby focusing on coal slurry pipelines. This strategy, however, may be vulnerable to constitutional challenge under equal protection grounds or Commerce Clause grounds, since all proposed coal slurry pipelines to date have been to out-of-state locations. At a minimum, a rationale explaining why the targeted groups are taxed, and other groups are not taxed, should be developed.

description of the coal severance tax as a general revenue tax¹², the U.S. Supreme Court was able to avoid a detailed cost assessment. The general revenue tax status enabled the court to “put to one side” cases involving user taxes imposed specifically for state services.¹³ The court further indicated that “States have considerable latitude in imposing general revenue taxes,” and concluded that “the appropriate level or rate of taxation is essentially a matter for legislative and not judicial evaluation.”¹⁴ The court also stated that the fourth prong was designed only to evaluate whether the measure of the tax was reasonably related to the extent of the taxpayer’s contact with the state.¹⁵ The coal severance tax was acceptable because it was assessed as a percentage on the amount of coal produced. A similar charge on the amount of water diverted, or on the amount of water consumed, would therefore appear to be constitutional.

The U.S. Supreme Court’s evaluation suggests that the Montana legislature would have considerable legal flexibility in setting the tax rate on water diversions. The only constraint apparent from the *Commonwealth Edison Co.* opinion is the possibility for due process or taking challenges if the adopted tax is so arbitrary as to amount to, “for example, the confiscation of property.”¹⁶ A severance tax on water equal to its full value would, therefore, be vulnerable. Another possible constraint may be based on a distinction between the resources being taxed. Coal is a nonrenewable resource that has high environmental costs upon extraction. Water, on the other hand, is a renewable resource whose extraction usually places fewer costs on the environment. It is uncertain whether this factual distinction opens avenues for different judicial treatment of a severance tax on water.

The Fairly Related to State Services Requirement

The final prong of the *Complete Auto Transit* test requires evaluation of the tax to determine if the assessment is “fairly related to services provided by the State.” By accepting the Montana Supreme Court’s

SOME GUIDELINES FOR SEVERANCE TAX LEGISLATION ON WATER

As a fundamental premise, it is constitutionally permissible to implement a state severance tax on water diversions occurring within the state. The tax, however, must be tailored to avoid constitutional difficulties. First, the tax must apply evenhandedly to both in-state and out-of-state users, and ideally should apply to both groundwater and surface water users. Exemptions are legally possible, but they must be carefully drafted to avoid equal protection or further Commerce Clause challenges. Second, the tax should not be set at a rate approaching 100 percent of water value. A 30 percent level, which is the maximum tax on the severance of coal, would be acceptable.

Beyond the constitutionality questions, there are other considerations that affect the desirability of a coal severance tax. The severance tax should be evaluated for its effect on other Montana water management strategies. At a minimum, it should be examined in relation to the state's prior appropriation laws, the

reservation system, and state water plans. An important question to address is whether the tax conflicts with other water policies. For example, does the tax hinder proposals emphasising water development as a means of avoiding loss of water rights to downstream states?¹⁷ In addition, the practicality of the tax must be evaluated. Ideally, a suitable rate can be determined that delivers a fair return to the state for the diversion of waters in Montana. In some instances, this assessment may not be worth the effort. A tax levied in areas with a surplus of water may result in little revenue for the state due to the low value of the water.

Finally, the most important issue to assess when considering severance tax legislation on water concerns the exemptions that will be written into the legislation. This politically hot topic must be given thorough review, because the exemptions may ultimately determine the constitutionality of the tax.

FOOTNOTES

1. *Mont. Code Ann.* ss. 15-35-101 *et seq.* (1983).
2. Telephone Communication with the Natural Resource and Corporation Tax Division, Department of Revenue, State of Montana, July 18, 1984.
3. 453 U.S. 609 (1981).
4. 430 U.S. 27 (1977).
5. 453 U.S. at 617, citing *Complete Auto Transit, Inc. v. Brady*, 430 U.S. at 279.
6. 453 U.S. at 617.
7. *Id.*
8. *Id.* at 618.
9. *Id.* at 619.
10. 453 U.S. 941, 958 (1982).
11. *Mont. Code Ann.* s. 15-35-103 (1983).
12. 453 U.S. at 621, citing *Commonwealth Edison Co. v. State of Montana*, 615 P.2d 847 (Mont. 1980).
13. 453 U.S. at 621.
14. *Id.* at 622, 627.
15. *Id.* at 626.
16. *Id.* at 629, fn. 17, citing *Magnano Co. v. Hamilton*, 292 U.S. 40, 44 (1934).
17. Montana Department of Natural Resources and Conservation, *A Water Protection Strategy for Montana — Missouri River Basin* (1982).

GROUP FOUR: STATE MARKET AND FREE MARKET

The water marketing issue triggered a broader dialogue over moving from the present mixed public/private water regulatory scheme to either a true market approach or a system of state control. In retrospect, a discussion on water marketing policy does not entail so drastic a solution in either direction, but the lid to “Pandora’s box” was opened and the resulting debate has been a lively one. The market advocates suggest that any water shortages would disappear once water rights were made transferable and private holders

could market water to out-of-state users. The state market advocates suggest that the best way for Montana residents to profit is to have the state sell or lease the water.

The papers in group four are concerned with these “big picture” aspects of water marketing. They discuss the role of a state market, the free market and “mixed markets” in allocating water, including prospective sales or leases of surplus state water.

Robie

Judge Ron Robie discusses the clearinghouse role for water transactions that the California government has assumed. This model amends the principle of water rights by introducing a system of allocation for future uses for expected growth similar to the reservation system that has been selectively applied in Montana. The difference is that in California the reservation is not dedicated to specific holders by name — municipalities or irrigators — but to the categories of use. The state holds the right and provides a permit to a subsequent applicant.

Judge Robie explains how the California system has attempted to address all three of the generic concerns raised in the seminar papers: control over the interbasin transfer of water to protect the area of origin; control over the sale of water to put the benefits to maximum use; and concerns for the future needs of the headwaters region even though it cannot currently put the water to consumptive use. He emphasizes California's role as a major water project developer and its reliance on the state water plan in guiding water development in the state. Robie notes the critical difference between Montana and California: all the tools that California needs are available because the north-south interbasin questions are intrastate policy matters, not interstate matters as in the Missouri River Basin.

Brown and Bonem

Lee Brown and Gil Bonem discuss the relevance of New Mexico's experience with transferable water rights as a way to address scarcity. The authors hold the premise that greater use of markets will help to allocate water more efficiently, but they point out that public perceptions may not regard this method as equitable. Water has a value that may or may not be recognized in a market situation, hence, the "community" perspective may prevail over the "commodity" approach inherent in markets.

Stress on the "commodity" dimension leads to the creation of a free market in which water would be allocated to its most valuable economic use. But the "community" dimension of water is entrenched in western political culture. Water is precious, in part because of its life-giving property and in part because of its perception as scarce. The authors suggest a useful integration of the commodity and community dimensions would entail state appropriation of unappropriated water in the state. Some of this water could then be leased under a commodity system, while the remainder could be held by the state for the benefit of Montana's residents (the community).

Anderson

Terry Anderson also addresses the problem of water scarcity in Montana and the West and finds shortcomings in the current system of water allocation. Unlike many critics, however, he does not fault the principle of prior appropriation; instead, the problem rests with the bureaucratic limitations and regulations imposed on the operation of the system. If water rights were allowed to be freely transferred, water would be allocated by price and delivered from wasteful to valuable uses.

Anderson states that current water shortages are because of artificially low water prices. He also asserts that the subjective nature of economic information makes it impossible to produce models capable of effectively allocating water among those who need it. Thus, the market process is the best means of alleviating the present and growing problem of water shortages. The benefits from moving to a true private market for water use outweigh the costs.

Doney

Ted Doney evaluates the policy strategies offered by Anderson, Robie, and Brown/Bonem. Doney disagrees

with Anderson's proposal that Montana should adopt a "free market" approach to water. He notes that under current law, water rights already can be transferred by sale and that numerous examples involving the marketing of water rights can be identified. Doney believes that Montana's basic system has evolved to address fairly many of the present concerns.

The Robie and Brown/ Bonem proposals are viewed favorably by Doney. These proposals give more emphasis to the interests of Montana (the "community") than the free market approach. Doney notes, however, that the Robie approach requires the state to act as a developer of water projects, a role that it has not performed particularly well in the past.

SUMMARY

The prior appropriation doctrine works well as long as water is available. As water becomes fully appropriated, concerns arise that the doctrine cannot guarantee equitable division of the resource. As a result, the doctrine is criticized for not fairly allocating water between upstream and downstream users. Likewise, since it deals primarily with water withdrawals, it has difficulty in allocating water between instream flows and consumptive uses. Finally, once a stream is fully appropriated, it is clear that the doctrine cannot fairly allocate water to future users. For example, how does one deal with intergenerational equity — the rights of future generations to water?

Judge Robie compares Montana's situation with the California practice in which the state serves as the manager and the marketer of water to be moved from one basin to another. Does this approach constitute an improvement over the present Montana system or will extension of the Yellowstone reservation system to other basins be adequate? The system in California serves to referee between upstream and downstream claimants and balance consumptive and instream uses. The reservation system within Montana could also do this if it was implemented for the entire state.

Robie's suggestions for innovations in water development projects can be compared with the Brown/ Bonem suggestions and with Dumars's ideas in the second group of papers. Both call for a more active role for the state as marketer of water that subsumes the more traditionally defined role of water regulator. Brown and Bonem elaborate by specifying that state water marketing must fit within the broader context of water regulation for the maximum benefit of the state's residents.

The "state market" and the "free market" have one thing in common — they presume to recognize that water should be priced according to its substitution value in order to be efficiently conserved. Beyond this common presumption, however, the two approaches diverge. The state marketing approach actually relies on a stipulated price, set by government, rather than a true market price. The state approach also has the advantage of being able to deliver larger amounts of water or of assigning a price or value to instream flows.

The free market approach is intriguing because, if water users are free to sell and buy water rights, then the question of surplus or scarcity would be resolved automatically, basin-by-basin. Water would be treated as though it had zero commercial value until a stream is fully appropriated. When demand exceeds supply, some water rights would be reallocated to more preferred uses by a bidding process. There are however, some equity problems; some people would resent "windfall" gains by people transferring water rights originally acquired at no cost. But this equity problem could be offset by the use of a transaction or gains tax. Montanans have long accepted the value of a water right when it is transferred along with the sale of land.

How do the free market and state market approaches compare in dealing with equity matters during periods of real or perceived water scarcity? Current debate focuses on three areas:

- (1) the conflict between upstream and downstream users;
- (2) the debate over consumptive versus instream uses; and
- (3) contests over how to balance future needs and present uses.

The state market approach would protect in-state water from downstream claims with regulatory controls designed to maximize the state's share of the basin's water resources. One possibility, advocated by Brown and Bonem, is for the state to appropriate the remaining unappropriated waters and from that appropriation lease some of the water to out-of-state consumers. The free market approach, on the other hand, places much greater reliance on private purchase of water rights. Protection from downstream users is attained primarily when all the surplus water is appropriated. At that point, the price of water could rise with growing demand until no shortage exists, but not so high that surplus water would be allowed to leave the state.

Anderson suggests that an earlier line of defense against downstream claims is to allow for the private purchase of instream flows in order to give them the status of a property right. However, the purchase of a perpetual instream flow right is a guarantee of delivery of water downstream; the only advantage would be the option to later convert it to a consumptive use. Instream flow uses are being protected in some western states by state laws requiring stream flows that insure adequate fish and wildlife habitat. The threat posed to water ecosystems by consumptive uses in these states is thus substantially reduced. It is not clear, however, whether a free market approach would adequately address the division of water between instream flows and consumptive uses. How can the free market account for the public, indivisible benefits of streams that cross vast expanses of territory? Some instream flows have direct commercial values, such as hydroelectricity, but most do not. If private interests are left to pay the opportunity costs of instream flows, such as for fish or recreation, these flows could be undervalued and streams

subsequently dewatered.

Future uses of water may be protected under the state market approach by a statewide reservation system similar to the system implemented by Montana for the Yellowstone River Basin or by the California system described by Judge Robie. Both systems place the state in the position of caretaker for future water needs anticipated for the state. The free market system relies on the competitive nature of the market. It is based on the premise that more efficient uses are able to bid more for water rights and thereby replace less efficient water uses. Thus, if proposed water uses are more efficient than certain present water uses, they should be able to outbid competitors for critical water rights.

A final comparison between the free market and state market approaches may be made in regard to the coal slurry ban. State markets, for constitutional reasons, are unlikely to retain laws with the prohibitory effects of most bans. However, as illustrated by the 1985 Montana water policy revisions, several "community" constraints may be instituted to control interstate water transfers. These constraints include the examination of water transfer proposals under state environmental laws and under public interest criteria which emphasize the water needs of the state's citizens. The state, as the water marketer, is the recipient of revenues gathered by any transactions.

The free market approach, like the state market approach, would not be a substitute for a ban on the use of Montana water for certain purposes. If coal slurry pipeline users could afford to bid up the price of water, they would acquire it. In addition, the free market could be used to gain revenues from prospective out-of-state water users, but the revenues would accrue to individuals and not to the state.

Judge Ron Robie

ALTERNATIVE POLICY STRATEGIES FOR WATER MARKETING: SOME OBSERVATIONS ON THE STATE MANAGEMENT APPROACH

The issue before this seminar is whether Montana water should be transferred out of state for certain industrial purposes and, if so, how should such transfer take place or be regulated.

California's experience with water transfers is

primarily one of intrastate movement of water rather than interstate transfer. However, there are similarities between the California "experience" and some of those problems which arise in interstate transfer of water which may make the experience in California useful to

those in Montana. In this regard, I will draw upon both the California legal structure and some practical experience I have had in implementing some of the legal concepts.

There is a basic common denominator between the issue of water export from Montana and California's experience: that is, protection of the areas of origin. In Montana it is the entire state which is to be protected against transfers for uses in other states. In California, it is protection of the northern portion of the state against areas to which water is exported in the southern part of the state. Thus, in both cases, the basic problem

is: how do you protect existing and future needs of the exporting area—the area of origin—in a reasonable and equitable manner?

In California approximately 80 percent of the people and the major demand for water, including for agriculture, is in the southern two-thirds of the state, yet 70 percent of the water originates in the northern third of the state.¹ Northern California and Montana can be compared to each other. The southern two-thirds of California and those states that may use Montana water for industrial purposes can be compared.

THE CALIFORNIA LEGAL FRAMEWORK

Water controversy in California is not new. In the 1920s plans to move water from north to south were formulated.² The California legislature responded with protective measures for areas of origin.³ The actual development of a statewide water project did not occur for many decades and only now, years after the water projects were in place and with the practical experience of their operation, can we evaluate the framework of legal protections.

1. State Water Right Applications. Since 1914, the primary means of appropriation of water in California is the permit system administered by the State Water Resources Control Board, a five-member quasi-judicial body whose members are appointed by the governor for staggered four-year terms.⁴ The board has been in existence since 1967. Previously the state had utilized a number of different administrative structures for this purpose. In 1927 the legislature enacted a law that provided for the filing by the state itself of applications to appropriate water "required in the development and completion . . . of a general or coordinated plan looking toward the development, utilization or conservation of the water resources of the state."⁵ These applications are exempt from the diligence requirement of California law and remain dormant until the development of the stream or area is about to begin. The "state filings" are, in fact, "reservations" but rather than being general, they are tied to a specific water project. In other words, rather than setting aside

all of the water or a percentage of the water in a stream, applications are filed on potential projects prior to their becoming viable. The state applications are held by the Water Resources Control Board until someone wishes to utilize the water covered by the application. If the project covered by the application is proposed, the application can be assigned to the developer by the board. If the developer proposes the use of the water covered by the application in a manner different from that in the state application, a "release from priority" can be made, which would eliminate the state application's priority over the new project.

It was intended that a key element of this reservation system be the "area of origin" protection built into it, which requires the board, when making assignments or releases from priority, to reserve water supplies for the counties of origin of the water. As a practical matter, in carrying out this responsibility the board does *not* provide a specific acre-foot reservation but, in effect, paraphrases the law by making the new appropriation subject to "any such water necessary for the development of the county." This is done because specific estimates of future needs are rarely available. One of the drawbacks of this reservation law is that water does not respect county lines.

If realistic data are available as to the needs of the area of origin during the foreseeable future, such a reservation provision could be useful and applied to the marketing, for example, by the state of Montana of water from federal reservoirs where the state has been given the authority to market such water. In the absence

of such information, reliance on the reservation can create a false sense of security.

2. Direct State and Federal Project Construction

Because of the enormous cost involved in moving water from areas of origin to areas of need, since the 1940s the major water transfers in California have been made by the state and federal governments. When the state and federal government began massive transfers from northern to central and southern California during the last 25 years, water wars broke out in earnest.

The federal Central Valley Project made its first deliveries in 1939 and today has major reservoirs and a canal system that annually delivers 4.5 million acre-feet of water to central California and the San Joaquin Valley.⁶

The State Water Project, which made its first deliveries in 1962, delivers approximately 2 million acre feet a year through an aqueduct system that extends south of the Tehachapi Mountains into the south coastal basin and serves users as far south as the Mexican border.⁷ Both the state and federal water projects transfer and allocate water. For example, the state water project serves 30 separate contractors covering a major part of the state. The water rights for the State Water Project are in terms of diversion and storage rights. No detailed permit terms control the place of use as would be the case in a small permit. The allocations among contractors (within the physical capabilities of the project facilities) are discretionary with the operator of the project. Transfers within the project service area generally do not need board approval.

Similarly, the federal Central Valley Project is an integrated system made up of many individual dams and aqueducts. The operator has considerable flexibility within the nearly 9 million acre service area to move water around and allocate it to users.

During the drought of 1977, water was reallocated from Southern California urban areas to agricultural users in the San Joaquin Valley by the state project. Water was also reallocated by the Central Valley Project, which operated a water bank. Thus, while the State Water Project operates pursuant to traditional appropriative water rights, the existence of physical works—an aqueduct system—to move water from one area to another makes the state, as a project operator, a major water allocator. I suggest that the state of Montana seriously consider serving as the project developer of any facility to transfer water out of the state.

3. Special Area of Origin Provisions. Although the state and federal water projects are operated pursuant to water right permits issued by the State Water Resources Control Board,⁸ they also are subject to additional area of origin protections of California law.

The “Watershed Protection Act” applies to both the state and federal projects. This law provides that the projects “shall not directly or indirectly deprive the watershed or area where water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, of the prior right to all water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein.”⁹ As might be expected, this general statutory protection sounds impressive but it must be converted into specific guarantees if it is to provide realistic protection to the areas of origin. In determining how such a statute should be implemented, one of the biggest problems over the years has been the failure of areas of origin, many of which are sparsely populated with only limited development, to evaluate realistically their future water needs. I suspect the state of Montana will have similar problems in quantifying its long-term needs.

What is the legal effect of the California Watershed Protection Act priority? Many years ago the Attorney General of California held that this provision creates an inchoate right or priority.¹⁰ Thus, aside from any state-funded projects, the protection is not automatic. Unless an entity in the area of origin has the wherewithal to exercise the inchoate right, it will remain unexercised. Thus, the *sine qua non* of the area of origin laws is the economic ability to take advantage of the legal provisions. This is a difficult problem that has to be faced realistically by any state involved in transfers. Californians have debated for years the future needs of the areas of origin. Are we thinking in terms of 25 years, 50 years, or 100 years in the future? Some people talk in terms of “ultimate” needs—whatever they are. This dilemma is raised by the *Sporhase*¹¹ case and some of the approaches that have been suggested for Montana. To merely reserve everything for the future and prevent export is *not* a rational means of proceeding. On the other hand, in the absence of a firm understanding of future needs, legal reservations may be practically worthless. The California experience convinces me that no system will eliminate the tensions or disagreements among areas of origin and areas of use. You must tailor a program to your specific needs.

When the State Water Project was approved by the voters of California in 1960, the legislative package that created the project included a unique feature intended to enable the areas of origin to meet their future needs and take advantage of these provisions. The \$1.75 billion bond issue which financed the project included a provision setting aside a portion of the bonds (almost \$300 million) to build future facilities to meet water needs in the areas of origin and to continue the delivery of water already being exported. Two things have happened since that time. First, water projects now cost a great deal more than contemplated in the initial bond issue, so the available funds are inadequate to develop any significant water projects in the areas of origin.

Second, even after all these years, the areas of origin still do not have a firm fix on their specific water needs. Exports continue to grow and the areas of origin continue to be concerned.

Nevertheless, I believe any state-developed water transfer program should include provisions to fund projects to meet local needs. The concept remains a viable one in overcoming the inherent practical limitations of legal protections. It must be flexible so that when projects are needed, there are no artificial limits on available funds.

4. The State Regulatory Approach. The Governor's Commission To Review California Water Rights Law

made an intensive two-year study of California law. In its 1978 report,¹² the commission recommended legislation to encourage "voluntary transfers of water rights, such as by sale or lease." The commission said that "where the interests of third parties and areas of origin are properly protected. . . such transfers are in the public interest."¹³ While the commission's specific recommendations to modify basic appropriation law were not adopted in its recommended form, several changes were made in California law to make transfers more simple.¹⁴ These will be more likely to affect private transfers than the state and federal projects.

A RECOMMENDATION: MARKETING BY THE PROJECT DEVELOPER

As has been mentioned, by building a 440-mile aqueduct system the state of California owns the only physical means of making a north-south water transfer. By providing an aqueduct system with alternative delivery points (the main aqueduct has several branch aqueducts and can serve varying quantities to the San Francisco Bay area, the San Joaquin Valley or Southern California) the state, by its operation of the project, can make transfers and reallocations on a daily basis, provided there is the contractual flexibility with its customers. It also can utilize unused aqueduct capacity to transfer water *owned by others*.

In building this water transfer capability and marketing the water or conveying the water of others, the state can set the price. The state water project in California operates on the concept that annually all of the costs allocated to each project use are recoverable from project users. Thus, water is not sold at a fixed price. At any given time, an acre-foot of water will cost the actual cost of project capital repayment and operations for that year divided by the water delivered.¹⁵ This procedure is vastly superior to selling water for a fixed price. Since the price of power and other variable costs have gone up dramatically in the last few years, those projects operating on fixed water prices can simply go bankrupt, unless they are operated by the federal

government. It is not realistic to sell water for a cost per acre-foot over a long term. If the state of Montana were to participate in the construction of a pipeline either by itself or in conjunction with other states or entities, it must develop a cost recovery program, taking this into account. Within a basic framework of such cost recovery, competition for the sale of water could be provided through competitive bidding within the structure of the state repayment program. While the California State Water Project is not managed in this manner, it has been suggested that such a procedure be utilized for additional increments of water it develops. It is a concept that merits serious consideration.

When a state becomes a water marketer and is responsible for the physical facilities necessary to market the water, it can directly carry out state policy with respect to protecting the areas of origin. Such a procedure is compatible with interstate allocation by compacts, since the compact must be entered into by the state. In addition, it is compatible with congressional allocation of water. (It may well be that water developed by a federal project in Montana may be transferred.)

Some people in California are frustrated by the dual responsibility for state management of water. The Water Resources Control Board is an independent quasi-judicial agency and its regulatory authority

includes jurisdiction over the state's own water project. This is important because it ensures that the state project is treated the same as any other appropriator in the state.

The Department of Water Resources, the water-marketing arm of the state, is directed by a gubernatorial appointee. This clearly puts the *marketing policy* and *pricing* responsibilities in the hands of a policy person, rather than a regulatory body.

Often when a program of water development is proposed, there is an insistence that the program be carried out within the framework of a state management plan or water plan. Throughout the West, most states have developed water plans. The California Water Resources Control Board must carry out its authority within the framework of the California Water Plan.¹⁶ Most water plans include: (1) a list of water projects that are desirable or, on the other hand, a list of minimum flows to be maintained in streams where projects could be built in order to protect the natural values of the streams, and (2) policies, which are usually stated in general terms.¹⁷ Once the state establishes these policies and assembles the physical needs, the question then becomes: "How do you evaluate potential uses against such a plan?" It is a very subjective activity and unless the responsibility is clearly placed on someone with a broad public accountability, it can be a very difficult one. In this regard interstate and intrastate transfers must be comparably treated.

One final aspect of interstate transfers needs to be considered. The situation is different when you are transferring *existing* developed water supplies or developing *new supplies* to be transferred. In California, the latter has been the primary experience. There is a growing interest by some existing users to transfer their existing water rights to someone else.¹⁸ In most cases the state or federal aqueducts must be used to transfer the water.

The experience of the state of California during the 1977 drought showed that water marketing could be effectively carried out.¹⁹ When existing water supplies are transferred, it is useful to have a governmental agency of some type to consider the policy matters that cannot be negotiated by buyer and seller. Particularly when dealing with interstate transfers, the state must be directly involved if it is to insure equitable treatment of

those within the state and those outside it.

I would like to close this short paper with a practical suggestion. Droughts come infrequently. The California drought of 1977 was the first major drought since 1934. A whole generation grew up without experiencing a real drought. People were used to a relative abundance of water. One thing that became dramatically clear from our drought experience was that shortage formulas of most water projects are unrealistic. They are designed to meet most needs even in dry years. That means in other years, more water is available than is needed for normal demands. Not enough consideration is given to the taking of realistic shortages in drought times.

I strongly recommend two possible marketing strategies to simplify the problems thus caused. First, when marketing water, consider requiring the buyer to obtain contingent dry year water supplies. In other words, build in greater shortages. This could be accomplished by the buyer contracting to overdraft groundwater or contracting to purchase agricultural water supplies. If the transfer is for coal slurry, the deliveries may be interruptible with the buyer required to have emergency coal supplies. If the transfer is not for coal slurry but for consumptive use, the seller could reduce the transfer in dry years more than traditionally would be required. Within the area of origin, arrangements may be made to buy out temporarily an area of origin user during the dry period and make that available for transfer. In California, for example, water that is used for growing rice could be purchased on a short-term basis for transfer at an economically advantageous price. This would increase the flexibility of the transferring agency and greatly reduce the stresses in the area of origin.

It is the delivering of a nearly full supply during the dry period that causes the greatest crisis in the area of origin. A long-term dependable supply can be obtained by the buyer by using alternative contingent sources for 10 to 35 percent of the normal water delivery in those infrequent dry years. Thus in few years will areas of origin be stressed.

Existing water marketing schemes are far too conservative. New creative efforts are needed. It is possible to create a transfer program that is realistic, fair and economically beneficial to both areas of origin and areas of need.

FOOTNOTES

1. California Department of Water Resources, **The California Water Plan — Outlook in 1982** (Preprint) Bulletin 160-82, December 1982, p. 11-2.
2. **Bulletin 160-82**, *op. cit.*, p. 11-6. Major urban water development projects predated these statewide efforts. At the turn of the century, San Francisco and Los Angeles were developing plans to go to the Sierras for water supplies. They were not without major controversy. In the case of Los Angeles particularly, this continues today. When San Francisco tapped the Tuolumne River in Yosemite National Park, this was one of the first environmental battles for the Sierra Club.
3. These are discussed in detail in Robie and Kletzing, "Area of Origin Statutes — The California Experience," 15 **Idaho Law Review** 419, (1979).
4. Cal. Water Code Sec. 175, 1200-1851.
5. Now Cal. Water Code Sec. 10500-10507.
6. U.S. Bureau of Reclamation, **Annual Report 1980**, Water Distribution 1980, Appendix 1, p. 282-284.
7. California Department of Water Resources, **Management of the California State Water Project**, Bulletin 132-83, No. 1983. This annual series, which began in 1964, summarizes pertinent data relating to the project.
8. Although the federal government as a project operator also allocates water, state control over these decisions is limited. *California vs. U.S.*, 98 S.Ct. 2985 (1978) provides that projects built under the Reclamation Act of 1902 must be operated in conformity with state water rights laws, but it is desirable to obtain contractual agreements to assure that state policies are carried out to the extent feasible in management of federal projects.
9. Cal. Water Code Sec. 11460 et seq. The Water Code also includes special provisions applicable to the Sacramento-San Joaquin Delta. This "Delta Protection Act" is similar in concept to the Watershed Protection Act. See Cal. Water Code Sec. 12200-12220.
10. 25 Op. Cal. Atty. Gen. 8, 17-18 (1955). The Superior Court for the City and County of San Francisco recently concurred in this interpretation. *U.S. of America v. State Water Resources Control Board*, Judicial Council Coordination Proceeding No. 548 (April 13, 1984).
11. *Sporhase v. Nebraska*, 102 S.Ct. 3456 1982.
12. California, Governor's Commission to Review California Water Rights Law, **Final Report**, December 1978.

A staff paper prepared for the Commission summarized California law and is most informative. Lee, Clifford, **The Transfer of Water Rights in California** (Staff Paper No. 5) December 1977.
13. California Governor's Commission to Review California Water Rights Law, **Summary Final Report**, December 1978, p. 3.
14. See Assembly, California Legislature, Office of Research, **A Marketing Approach to Water Allocation** (February 23, 1983).

See also California Water Code Sections 1725-45 (temporary and long term transfers) and policy provisions in Water Code Section 109: "It is hereby declared to be the established policy of this state to facilitate the voluntary transfer of water and water rights where consistent with the public welfare of the place of export and the place of import."

"The Legislature hereby directs the Department of Water Resources, State Water Resources Control Board, and all other appropriate state agencies to encourage voluntary transfers of water and water rights, including . . . providing technical assistance to persons to identify and implement water conservation measures which will make additional water available for transfer"
15. This form of cost recovery has been criticized severely. It is argued that the state should obtain "market value" rather than recover its costs. Such a recommendation is politically infeasible in California since the existing process is well established.

Debate over this market value concept should not obscure the real issue presented in this paper, that is, should the state have a major role in the marketing of the water? Once the state role is established, either pricing system will work.
16. Cal. Water Code Sec. 1256. See *Johnson Rancho County Water District v. State Water Rights Board* (1965) 235 Cal. App. 2d 863.
17. For an example of a modern statement of such policy, see California Department of Water Resources and Water Resources Control Board, "Policies and Goals for Water Management for the Next 20 Years," **Bulletin 4**, January 1982. This updated the original "California Water Plan," **Bulletin 3**, May 1957.
18. See Assembly Calif. Legislature, Assembly Office of Research, **A Marketing Approach to Water Allocation** (Feb. 23, 1983).
19. Major transfers within the State Water Project took place. Also some water of others was transferred. The process, however, included significant controversy over area of origin issues. For a summary of California water management during the drought, see California Department of Water Resources, **The 1976-77 Drought — A Review**, May 1978.

Lee Brown and G. Bonem

SOME REMARKS ON THE ROLE OF MARKETS IN MANAGING WESTERN WATER

We are pleased to have this opportunity to address this committee on the subject of water markets and water marketing. We have been studying this subject for some time now with particular reference to New Mexico, the Southwest and the Colorado River Basin. We hope some of the observations and conclusions we have made and reached about water markets in those geographic regions will be useful to your deliberations here in Montana.

Let us briefly outline the major elements of the remarks we will make. First, it is important to consider both the historical and the current context within which decisions about water markets as an institution are being made. The suitability of this candidate institution should be judged against the function it is intended to serve.

Second, we will make some general remarks about water markets, built around the experience of New Mexico, which the **Wall Street Journal** has editorially characterized as the one western state that places main reliance on the market as its water reallocating institution.¹ In this discussion we will try to point out both advantages and disadvantages of the marketplace for water. Third, we will describe what we, and others, term the *community* approach to water, particularly as contrasted with the *commodity* dimension of water as found in the marketplace. Finally, we will make a few comments about the situations of New Mexico and Montana relative to the existing and potential out-of-state demand for water occurring within their respective borders.

WATER AND WATER MARKETS IN THE WEST

In discussing water and water markets in the western U.S. there is no better place to start than John Wesley Powell's 1878 *Report on the Lands of the Arid Region of the United States*.² The report was the result of more than ten years that Powell had spent exploring, mapping, measuring and pondering the conditions found in the arid West.³ Powell described in detail temperatures, precipitation, streamflows and elevations in the West. More importantly he set forth a series of policies for western development that, in sum, provided the most coherent blueprint for the West that was available. Powell's vision of the West involved an irrigated, agrarian democracy, Jeffersonian in character, and in which the key natural resource would be water. His prescriptions for western water policy were often controversial, but they provided the first attempt at scientific analysis of this complex western problem.

Today, more than a hundred years after publication of Powell's report, the West is vastly different. The key role of water remains unchanged. There is, however, an enormous difference in the character of water problems that we face today, and the crucial difference involves the full or near-full appropriation of western water that is evolving. In our home state of New Mexico there is very little unappropriated water and some basins are probably over-appropriated. In Montana, as we understand the situation, the current debate is principally about who shall obtain unappropriated waters and what is an efficient, equitable and democratic way to manage what are, in fact, some of the few remaining unappropriated water supplies in the West.

The contemporary era is, then, one of water management, and one way to manage water is through the market mechanics. Essentially, the marketplace allocates water in accord with dollar votes: the person or company choosing to bid the highest—that is, vote the most dollars—will obtain the water. Persons or companies that make only low bids will receive only small or negligible amounts. Thus, water allocation and management occur through casting bids or dollar votes

or water, and, in the marketplace, water becomes a freely transferable commodity. Currently, the market mechanism is being used to some extent in New Mexico, and a brief description of New Mexico's water markets may be helpful in Montana.

1. An explicit statement about New Mexico's policy toward water markets appears in the state's 1976 Assessment of Water Resources:

Aside from the small amounts of water that presently are surplus to current requirements in New Mexico, the only way in which water requirements can be met is by using existing water supplies more efficiently or by using water supplies for a different purpose than they are now being used. One of the assumptions used in [this New Mexico document] is that increased needs for municipal, industrial, mining, and certain other uses will be met by retirement of irrigated agriculture. Fundamental to this assumption is the prior assumption that irrigation water produces less cash return than an equal amount of water used in manufacturing or mining. Therefore, it could be purchased and transferred to such a higher economic use. . . . New Mexico's [water] law provides for the change in place and purpose of use; and such transfers are and have been taking place for many years.⁴

A more recent statement to the same effect was made by Steve Reynolds, New Mexico's State Engineer, in federal District Court testimony in the case of *El Paso v. Reynolds*, in 1982:

Under New Mexico law and, of course, based on our 1907 legislation, a person has the right to change the place and purpose of his water right if that change can be accomplished without impairment of or detriment to any other water right. And it can be accomplished only by application to the State Engineer in dealing with surface water or waters in declared underground water basins, and that mechanism has, of course, been used to meet growing municipal and industrial requirements by the acquisition and transfer of irrigation water rights.⁵

2. The process by which water transfers occur in New Mexico has been described by Khoshakhlagh and associates.⁶ After two parties agree to a transfer, the buyer files an application for transfer in the state engineer's office. The application is examined for procedural adequacy and for possible negative effects on other rightholders or the public interest. If the transfer is approved, public notice must appear in a newspaper for three weeks. Protests of the transfer may be filed with the state engineer's office, and decisions of this office, whether approval or rejection, may be taken to district court.

3. By no means is all water in New Mexico freely transferable. One barrier to market transactions is that in some basins water rights have not been adjudicated, and quantities of water to which rightholders are entitled are inadequately defined. A second barrier is that some (but not all) Bureau of Reclamation contracts for water supply from federal projects have non-transferability or limited transferability clauses. A third barrier is that various conservancy and irrigation districts in the state maintain that water rights held within their boundaries cannot be transferred outside their boundaries without the district's consent. A fourth barrier is that interstate compacts may limit transferability. For example, the Rio Grande Compact involving New Mexico, Texas, and Colorado effectively prohibits water transfers from northern New Mexico to central New Mexico via compact arrangements for streamflow accounting. In addition to these barriers to water transfer, there are others. In particular, we shall discuss below how social and cultural attitudes modify the operation of New Mexico water markets.

4. During the seventies and eighties, frequent use of the marketplace for water has been made in virtually all basins of the state with the price paid for the perpetual right to one consumptive acre-foot of water having ranged from \$150 in a basin still possessing unappropriated water to over \$11,000 in a sub-basin fully appropriated and dominated by municipal use. In some basins the price escalation has been dramatic.

Let us generalize for a moment and list a few of the major advantages and disadvantages of water markets.

1. One important advantage is that water markets provide decentralized decision-making about water allocation. Rather than having a centralized agency allocate water to different companies and people via decree, the market allocates water by having individual economic agents voluntarily decide the amounts they will pay for water or accept as payment.

2. Another advantage of water markets is that water tends to move to uses in which it has highest economic

value. That is, if the net return on water in power generation is \$500 per acre-foot and in raising alfalfa is \$35 per acre-foot, the power company will be able to bid water away from the irrigator. Thus, the economic product produced by water tends to be enhanced. A byproduct of this market pricing is that the price itself comes to provide a clear signal of the opportunity cost of using water in any particular enterprise, with wiser decisions being one likely result.

3. Another advantage is that there is relatively rapid accommodation of new water users. If water transfers in the marketplace were simply disallowed, it would be difficult for new users such as growing cities or energy companies to obtain water.

Having listed our perception of the main advantages of water markets, let us note parenthetically that use of the marketplace is unlikely to require, on a regionwide basis, abandonment of enormous amounts of irrigated acreage. Water requirements of cities, energy companies, and other new uses are relatively small in comparison with water use in irrigated agriculture. The marketplace would shift some water away from irrigated agriculture to these other uses, but the quantitative volume of this shift is not likely to be enormous in most cases.

Are there disadvantages of water markets? We think there are.

1. One disadvantage is that water rights may be consolidated by one or a few entities. Consolidation may effectively prohibit other water demanders from obtaining water. Though largely undocumented, such consolidation of ownership has apparently occurred in one basin in New Mexico in which a few copper companies control over 90 percent of the water rights with the result that a local community has had difficulty obtaining rights it needs because of population growth. John Wesley Powell and his followers, particularly Elwood Mead, were concerned about the dangers of water monopolies one hundred years ago,⁷ and in the 1980s we should be watchful for problems of water rights consolidation.

2. Another disadvantage of water markets is that there may be unequal access to the market. Two examples suffice to clarify this point. First, Khoshakhlagh and associates mention that there may be general ignorance about the water transfer procedure.⁸ General ignorance about average and acceptable water right prices is another dimension of the problem with inequitable treatment one possible result. A second example of unequal market access is that in New Mexico a company interested in acquiring water rights to

maintain a creek flow for instream fishing could not do so. Instream water uses are not recognized as beneficial use of water in New Mexico and some other western states.

Our view is that, in general, the advantages of water markets outweigh the disadvantages and that western states should place greater reliance on water markets. Yet, there is one limitation of water markets that is greater than the preceding ones and consists of the fact that water has social, cultural, and symbolic values in addition to its purely marketplace value as a commodity. An approach to water issues that emphasizes these social and symbolic values we call the *community* approach to water. The implication of this approach is that water is more than just another commodity, and consequently cannot be treated exclusively as such. The proposition, then, that the West needs more reliance on water markets must be followed by the proposition that the water market is only an institutional instrument, not a fetish, and that the community interest in water must sometimes be asserted in order to secure legitimate public aims. Let us elaborate on this community aspect of water.

The Community Approach to Water

The community dimension of water refers collectively to the social, cultural, political and symbolic values of water that give it an importance beyond the value that is established in the marketplace. These community values of water stem from several sources.

1. Water is one of the basic features of the natural landscape. Whether it is found in rivers, lakes or oceans or not found at all as in deserts, it plays a fundamental role in nature. The early Greeks thought that the four elements of nature were earth, water, fire and air.⁹ Aristotle's *Politics* mentions the importance of an adequate water supply for civil society.¹⁰ In New Mexico, the valleys of the Rio Grande and its tributaries were the first lands colonized in the Southwest by the Spaniards. In the American settlement of the West in the 19th century, a major concern involved the adaptation of American civilization to the aridity west of the 100th meridian. Thus, water, unlike fertilizer,¹¹ is a significant and enduring feature of the natural landscape as we know it.

2. Related to the first point, but also separate, is the nonsubstitutability or limited substitutability of water in some important uses. This is, perhaps, an oblique way of saying that human beings cannot survive without water; that there are many or most crops which must have water and that wildlife must also have water. Thus, it is possible to substitute other commodities for some water use in only a limited way. Machines and labor are substitutes; we can ride buses rather than drive automobiles; but the residents of a city cannot, say, substitute plastics for water in its fundamental life-sustaining uses.

3. Reinforcing these two aspects of water in the American West is the aridity that characterizes much of the region. We have already noted the key role that John Wesley Powell assigned to water in the West more than a hundred years ago. Even before Powell, the acequias (ditch organizations) of northern New Mexico were the key village organizations in Spanish colonial times. A contemporary view of Western aridity is found in the *Wall Street Journal* editorial previously cited:

"For semi-arid states with rapidly growing population, a description that fits the entire Southwest quadrant of the country, the water supply is close to a life-or-death concern."

What we are suggesting here is that for most individuals, particularly in the arid West, water is *perceived* as something more than simply a physical commodity useful in a variety of ways in enhancing material well-being. Let us illustrate this perception with several examples.

A. In 1983 we conducted a survey of 98 community leaders in a five-county area of northern New Mexico and southern Colorado (Rio Arriba, Taos, and Mora counties in New Mexico; Costilla and Conejos counties in Colorado). This region is heavily Hispanic and was an area of Spanish settlement almost four hundred years ago. At present a limited number of water right sales are occurring in the area, mainly near the larger towns such as Taos. But the attitude toward water sales by the communities in the region is consensus opposition. Over 80 percent of the leaders interviewed said that people in their community were opposed to water right sales. Hispanic opposition to water right sales appears to have a social and cultural origin. For example, one interviewee said, "I don't think that the native people want to sell their land or their water rights. . . . We want to maintain our. . . culture." Interest in preservation of Hispanic culture in the Upper Rio Grande is a value that appears to have top priority, and the consensus opposition to water right sales derives from this and related cultural values.¹²

B. A second illustration of this community value of water is the American Indian effort to gain control over the use of water they feel is legitimately theirs. Indian

efforts might be interpreted by some exclusively as attempts to obtain a resource that would improve their economic condition. Certainly the desire for economic improvement accurately describes part of their motivation. But economic gain does not adequately explain 1) the strong desire among many tribes to own the water collectively rather than as individuals, 2) the strong resistance to any sort of a cash settlement that left them without "wet water," or 3) their preference in many instances to use the water in agriculture, which in the urbanizing parts of the West may not be the most profitable use economically. The crucial aspect of Indian water struggles is, instead, symbolic and cultural. The importance to Indians of control over "wet water" has a significance substantially beyond the dollar revenues that the water might generate. We suggest this interpretation of Indian water struggles is closer to the actual situation than a strictly marketplace interpretation.

C. New Mexico has recently experienced efforts by entities in two neighboring states to obtain "New Mexico" water. The first case, recently decided by the U.S. Supreme Court, concerned an effort by Colorado Fuel & Iron to obtain water from the Vermejo River which rises in Colorado but has been fully appropriated in New Mexico for many decades. The second instance is the El Paso case which has been already described and discussed in previous papers at this meeting. Our point in raising these cases is that the emotional response of both the New Mexico citizenry and its officials cannot in our judgment be explained simply in terms of the economic value of the resource. The perceived stake in the cases is not only economic but even more the fairness or equity of the out-of-state claim and the control of a secure community future that water epitomizes and symbolizes in this arid region. As one water official told us privately, "the trouble with you economists is that you think everything can be added up in dollars and cents."

Now, even if one assents to the perceived importance of water as exceeding its marketplace value,¹³ one may still argue that such perceptions are misguided myths that should be debunked. Indeed, many economists and lawyers have been trying to accomplish this task for years in arguing that water is *not* different. Yet the perception persists and is widespread. Whether such debunking efforts are well-founded is a normative argument into which we do not wish to enter today. It is enough for our purposes here simply to report that the community dimension of water is strong and pervasive and that any public policy that denies or ignores it is likely to founder.

Community Value of Water and the Situations of New Mexico and Montana

We now turn to the importance of this community dimension for the water problems of New Mexico and Montana. In New Mexico, a key problem is that there is some remaining unappropriated groundwater that, if appropriated, would ultimately affect streamflow, though the future timing of that effect is a matter of hydrologic dispute. There has been an attempt to appropriate some of this water by the city of El Paso, Texas, and this attempt led to the court case *El Paso v. Reynolds* previously mentioned. Consider two separate approaches to the management of this unappropriated groundwater.

1. Commodity approach: In this approach water is to be managed like any market commodity. The unappropriated groundwater is first distributed on some rule with one possible way being the prior appropriation doctrine, that is, first come, first served. From that point the water goes to the entity bidding the most dollars for it. For example, if an out-of-state company bids highest, water is simply transferred to this bidder.

2. Community approach: The community approach to unappropriated groundwater in New Mexico would begin with the recognition that the few remaining unappropriated waters in the state are touched by strong elements of public interest. Because there is so little unappropriated water remaining, this water has symbolic and social values well beyond its market value. Thus, the community approach to water implies that the public interest could be asserted through active state appropriation of unappropriated groundwater.¹⁴ New Mexico has not yet studied all of the economic, political, and social issues associated with state appropriation, but two points are clearly important.

(A) If state ownership of unappropriated groundwater is to give the state legal right to allocate this water, the ownership must be more than a "legal fiction"; it must

be real. "Real" ownership will involve state financial investment in wells and, perhaps, distribution systems.¹⁵

(B) It would seem that if state ownership of unappropriated groundwater occurs, the state would have power to regulate water sales to out-of-state users.¹⁶ But we also maintain that this power (if it exists) would need to be asserted in a manner consistent with the community importance of water.

As owner of the groundwater, New Mexico should accept some sense of community obligation toward its neighbors and their problems. Note in this regard that the New Mexico Water Law Study Committee report contemplates the possibility of leasing water out-of-state.¹⁷

Now let us turn to your situation here in Montana and examine the implications of our remarks up to this point. First, it should be said that we do not have a detailed familiarity with the water situation you are facing and your evaluation of our comments should take that fact into account. However, it seems clear that there is considerable unappropriated surface water flowing through the state and that the Missouri River Basin, particularly, contains one of the few substantial bodies of unappropriated water remaining in the West outside of the Pacific Northwest. We suspect that in this situation the remaining water has strong community value beyond its value strictly as a commodity. Thus we would expect to see an assertion of public interest in the remaining water as, indeed, may already have occurred in reaction to South Dakota's agreement with ETSI.

In considering a policy by which to govern its actions relative to this water, a state faces two basic questions. First there is the question of what portion of the river it will control, and second there is the question of how it will manage whatever water it ultimately does control. With respect to the first question, if the water has community value, then that value is almost certainly held by the citizens of all states in the basin, in Nebraska and Kansas as well as in South Dakota and Montana. State appropriation or any other device for extending one state's claim to the water, while perhaps of tactical value, is not going to obviate the need for an apportionment that is generally judged to be equitable irrespective of how that apportionment is finally obtained. Though extremely unpalatable to western states, there always remains the specter of strong federal intervention if no formula generally perceived as

equitable can be produced by the community of basin states. Given the tenor of recent U.S. Supreme Court decisions relating to water, federal intervention, at least judicially, would suggest a heavy, perhaps exclusive, reliance on a commodity approach to water so that it would flow to the highest bidder without regard to residence or other criteria.

As for the second question stated above, once the remaining waters in the Missouri Basin have been apportioned, the community approach implies that the state of Montana might usefully consider state appropriation of its unappropriated water. As we have stated, the unappropriated water has strong social and symbolic values. A simple distribution of it according to prior appropriation with subsequent transfer to the highest bidder, even if that bidder were out-of-state, might be inconsistent with the community interest. On the other hand, with state control assured, a leasing to out-of-state users might be acceptable to your citizens. The option would be yours.

Consider the situation of the state of Colorado and the Colorado River Compact. Even with extensive transmountain diversions from the western slope of the Rockies to the urbanized front range, it has not been able to put to consumptive use its allocated share of the river under the compacts. Moreover, there are strong interests supporting the maintenance of streamflows on the west slope for instream values, which are considered beneficial uses in Colorado. If the terms of the Colorado River Compact were more agreeable to Colorado, then by state appropriation the state could preserve instream values *as well as* benefit financially from leasing its water rights to downstream users.

Some of the important features of a state appropriation option, then, can be listed:

- (1) The decision about timing of water development is left in public hands. A public desire to conserve or maintain instream flows rather than develop can be accommodated.

- (2) The state could implement a plan for leasing water that it wishes to use for development. Water leases might go to the highest dollar bidders, thereby incorporating one of the advantages of water markets.

- (3) The state could appropriate *some* of its remaining water without appropriating all of this water. Thus, the state is free to choose a mixed water economy in which some water is privately owned and some is publicly owned.

SUMMARY

Let us now summarize our views on Montana's situation in the Missouri River Basin. First, the community value of water implies a need for an apportionment of unappropriated water in the Missouri Basin. Because we lack knowledge about the comparative merits of Upper Basin and Lower Basin claims to water, we confine our remarks to the idea that this apportionment must be generally perceived as equitable. Second, within the constraints of basinwide apportionment, the community approach to water implies that Montana should consider state appropriation as an institutional device for controlling

its share of the remaining water. Some leasing of this publicly owned water would obtain benefits of water markets. Third, there needs to be more study of state appropriation of remaining water before this institutional vehicle is actually used in either New Mexico or Montana. It should be understood, however, that state appropriation would be a major change in the way of conducting water affairs from what has prevailed up to the present. Additional study and discussion of the issues involved would help clarify some of the points we have mentioned.

FOOTNOTES

1. *The Wall Street Journal*, April 26, 1982, p. 24.
2. The 1962 edition by Harvard University: John Wesley Powell, *Report on the Lands of the Arid Region of the United States* (Belknap Press of Harvard University Press, Cambridge, Mass., 1962).
3. Wallace Stegner, *Beyond the Hundredth Meridian* (Houghton Mifflin Co., Boston, Mass., 1953).
4. U.S. Bureau of Reclamation in cooperation with the State of New Mexico, *New Mexico Water Resources: Assessment for Planning Purposes*, Nov., 1976.
5. Testimony of Steve Reynolds, N.M. State Engineer, in transcript of proceedings of *El Paso v. Reynolds*, et. al. in U.S. District Court, Albuquerque, NM, Sept. 13, 1982.
6. Rahman Khoshakhlagh, F. Lee Brown, and Charles DuMars, *Forecasting Future Market Value of Water Rights in New Mexico*, Water Resources Research Institute Report No. 92, 1977, Las Cruces, NM.
7. Wallace Stegner's Introduction to the 1962 edition of Powell's Report, *op. cit.* Also, Richard Alston, *Commercial Irrigation Enterprise, Fear of Water Monopoly, and Genesis of Market Distortion in the 19th Century American West* (Arno Press, New York, NY, 1978).
8. Khoshakhlagh and associates, *op. cit.*, p. 23.
9. Perhaps the first Greek writer to speak of these four elements was Empedocles. The idea was common by the time of Plato's dialogue, *Timaeus*. See, for example, G.E.R. Lloyd, *Early Greek Science: Thales to Aristotle* (W.W. Norton & Co., New York, 1970) pp. 39-42 and pp. 74-77.
10. Aristotle, *Politics*, 1330 a-b.
11. The noncomparability of water and fertilizer is taken from Arthur Maass and Raymond L. Anderson, . . . and the Desert Shall Rejoice (MIT Press, Cambridge, Mass., 1978), p. 5:
"Economic growth, however, is in the case of irrigation agriculture so competitive with other objectives that farmers typically refuse to treat water as a regular economic good, like fertilizer, for example. It is, they say, a special product and should be removed from ordinary market transactions so that farmers can control conflict, maintain popular influence and control, and realize equity and social justice."

Terry Anderson

CONFLICT OR COOPERATION: THE CASE FOR WATER MARKETS

Rising demands and dwindling supplies for any goods, services or inputs in the absence of markets tend to generate political conflict. This is certainly true in the case of water where individuals, cities, states, and counties are battling for the precious liquid. Dried-up water supplies, sink holes the size of football fields, huge sprinkler irrigation systems, and rivers that catch fire are all indicators of the impending water crisis. The key question we face in the next decade is not whether

water will be there, but rather will we allocate that water through conflict or cooperation (Anderson, 1983a).

The answer to this question will depend on our willingness and ability to restructure the existing institution. To do this we must first understand what penalties and incentives are inherent in the alternative institutions. A system of well-defined and enforced private property rights links authority with responsibility and promotes cooperative exchanges

resulting in gains from trade. In contrast, the political process most often results in conflict because there is not *quid pro quo*. To understand the possibilities for the market allocation of water, we must first ask what is the nature of a market. How did water rights in America evolve, and why do we not have a market for water? Will or can we have water markets in the U.S.?

The Nature of Markets

Before we can understand what institutions are necessary for a water market, we must first understand what a market is and does. For economists this may seem like a trite question, but most economic analysis does not focus on the fundamental economic problem. That problem is *not* simply to solve an optimal control problem or a general equilibrium model for the marginal rates of substitution among combinations of outputs or inputs. The economic literature in general and the natural resource literature in particular has focused on the mathematical formulation of allocation problems and led policy makers to believe that centralized allocation and even multiple use management is possible. With enough equations and data this approach to economics lends itself well to centralized planning, though the results are often different from what is planned.

As Friedrich Hayek (1945) pointed out many years ago, however, this “is emphatically *not* the economic problem which society faces” but rather “it is a problem of the utilization of knowledge which is not given to anyone in its totality.” From this formulation of the economic problem, two important aspects of markets emerge. First, we must be aware that markets are a process rather than an institution. The market process involves the coordination of individual actions as the actors attempt to make themselves better off. Through these actions gains from trade are exhausted and the allocation of resources is moved in the direction of efficiency. Markets are not static; they represent different actions at different times in response to different perceptions. To “create a market” or to replicate one becomes an impossible task once we recognize that it is a process rather than an event that we are trying to imitate. The key is that human action is coordinated through the market process which generates

information and incentives for adjustment.

The second element of the market process that must be understood is that only individuals have “the knowledge of the particular circumstances of time and place” (Hayek). Regardless of the size of computers, it is impossible to aggregate this particular information into data which can be fed into the planning process. As people coordinate their actions through the market process, their knowledge of particular circumstances is revealed through prices, which convey information about those circumstances. This information, however, comes from the market process and cannot be generated in its absence. Given today’s rapidly changing circumstances, it is only individuals each in possession of the small amount of the total knowledge who can react to the relevant changes to enhance efficiency.

Related to the second element is the recognition that all values are subjective. Economists, of course, discuss the demand for final goods and services in this way; clearly the utility function of individuals is subjective (Buchanan, 1969). On the cost side, however, there is a tendency to treat costs as objective. The implication is that the engineering nature of the production function is all that is necessary to reveal costs. But once we recognize that all costs are opportunity costs, we must also recognize that those costs reflect human demands that are given up. In other words, costs are determined by demands elsewhere in the system and therefore are subjective. The realization that all values are subjective immediately throws into question all benefit-cost studies. We might be able to do a benefit-cost analysis in cases where the market process and the resulting process translate subjective values into objective measures, but these are precisely the cases where there is no need for benefit-cost analysis. In those cases where the market process is not operating, it is not possible to obtain objective measures of the subjective values. Within this framework, an instrumentalist approach to law is also thrown into question. Given subjective values, it is impossible for courts or their appointed agents to carry out any comparison of benefits and costs. As we shall see, this point is particularly important for water law.

Let us put this understanding of the nature of markets into the context of water allocation. As the demands on a particular water source have increased, values of municipal, industrial, agricultural, and recreational uses have had to be traded off against one another. Those values will be continually changing across time and space. If private property rights to water are enforced and transferable, individuals interacting through the market process will reveal their subjective values and make the necessary trade-offs. No single planner or group of planners could possibly have the necessary knowledge of the particular circumstances of time and place to replicate this process.

None of this discussion is meant to ignore the possibility that water rights may not be well enough defined, enforced, or transferable to allow the market

process to account fully for all subjective values. Where rights are too costly to specify, the market process will break down, but some alleged "market failure" results from legal constraints placed on the process. The more prevalent these constraints, the more likely water allocation will turn into political conflict. By recognizing how the market process could work in water allocation, there is a possibility of removing these constraints and encouraging cooperation.

The Evolution of Water Markets

Given the importance of particular circumstances of time and place, it is difficult to design the correct institutions for allocating a resource like water because continually changing values necessitate continually changing rights. To have gathered together a group of water experts in 1880 and expected them to predict the demands for water today would have been absurd. At that time they would have been thinking about mining and agriculture and given little thought to municipal, industrial and certainly recreational uses.

Just as the market process evolves, so do the rules of the game which govern the behavior of people in that process; people produce institutions. Therefore, people will devote their efforts to defining and enforcing rights as long as their perceived additional benefits from doing so exceed their perceived additional costs. At any time, a unique amount of effort will be put into the definition and enforcement activities (Anderson and Hill).

The frontiersmen entering the Great Plains faced circumstances that were quite different than their predecessors. With an average rainfall of between 15 and 20 inches annually on the Great Plains, it was clear from the start that access to water was a prime consideration. Hence, initial settlements occurred along river and stream bottoms. As long as there were vacant stream locations, the right to water accrued to the one who owned the bank of the stream and who had access to it by virtue of position. These riparian rights found historical precedent in eastern laws that had been borrowed from the English common law. Early judges and lawyers in the west were familiar with eastern law and were inclined to transfer it to the west.

As the settlement pressure increased, however, so did the pressure to change water institutions. Two factors

were at work. First, mining technology required that water be taken from the stream and moved to nonriparian locations. Second, a great deal of nonriparian agricultural land could be made more productive if irrigation water could be moved to it.

Since the California mining camps were the first to feel major population pressure, the miners played an important role in the evolution of the prior appropriation doctrine.

Following a tradition of collective action on the mining frontiers of other continents, the miners formed districts, embracing from one to several of the existing "camps" or "diggings" and promulgated regulations for making and recording claims. The miners universally adopted the priority principle which simply recognized the superior claims of the first arrival. . . (McCurdy)

Included in this first arrival principle were the rules that regulated the water. The miners quickly realized that gold was not only found along stream beds, where a pan and shovel were all that were needed to extract the precious mineral. When deposits were discovered several miles from a stream, it made economic sense to move the water. "It universally became one of the mining customs that the right to divert and use a specific quantity of water could be acquired by prior appropriation" (McCurdy). These customs had;

one principle embodied in them all, and on which rests the "Arid Region Doctrine" of the ownership and use of water and that was the recognition of discovery, followed by prior appropriation, as the inception of the possessor's title, and development by working the claim as the condition of its retention (Kinney).

When the inevitable conflicts arose over water rights, judges were torn between their training, which taught them that decisions ought to "conform, as nearly as possible, to the analogies of the common law," and the western tradition, which held that law "ought to be based on the wants of the community and the peculiar conditions of things" (*Hoffman v. Stone*, 1957). As a result, some courts found that appropriative principles were impractical and others found that cases must be decided by priority. The inability of courts to shed the shackles of previous institutions and recognize the importance of the new resource constraints led to an interesting and eventually harmful mix of eastern and western law.

The eastern law brought with it such concepts as usufruct, beneficial use, and reasonable use. At first glance, usufruct, which specifies that the water does not actually belong to the individual but rather is only available for the individual's use, does not appear to inhibit allocation. Over time, however, this concept has come to mean that the water actually belongs to the state and therefore is subject to all manner of state regulation. Similarly, beneficial use and reasonable use are concepts that have been used to allow state

legislatures to define those terms and preclude certain allocations. In Montana, the state constitution goes so far as to specify that using water for coal slurry pipelines is not beneficial. To make matters worse, the riparian doctrine maintained an element of common property by continuing to support the view that riparian owners have co-equal rights in water. Since riparian rights are generally not transferable, the possibility of market allocation was further restricted.

The doctrine of appropriation, on the other hand, established ownership rights that were clearly defined, enforced, and transferable. From the western mining camps and cattle ranches came absolute property, equal footing for uses, and transferable ownership rights. As a result, markets were left to determine the value of water. The California courts asserted that “a comparison [by the courts] of the value of conflicting rights would be a novel mode of determining their legal superiority” (*Weber v. Eureka Lake Company*, 1860). As Charles McCurdy stated, “Anyone might take and use water flowing on the public domain for any beneficial use subject only to the rights of any prior appropriators”. The doctrine of appropriation gave no preference to riparian landowners, allowing all users an equal opportunity to compete for water. Appropriations were limited according to the means used for appropriating or the purpose of the appropriation.

The law that evolved in the West reflected the greater relative capacity of water in the region. As the settlers devoted more efforts to defining and enforcing property rights, a system of water law evolved that (1) granted to the first appropriator an exclusive right to the water and granted water rights to later appropriators on the condition that prior rights were met; (2) permitted the diversion of water from the streams so it could be used on nonriparian land; and (3) allowed for the transfer and exchange of water rights between individuals.

Under this set of water institutions, individuals invested in projects to deliver water where it was demanded. Well-defined exclusive rights provided the necessary tenure security to stimulate private investment. By 1910, over 13 million acres in the West were irrigated by private ventures. Between 1900 and 1910, the number of irrigated acres grew by 86.4 percent, with private enterprise accounting for almost all of the increase. A variety of organizational structures were used to mobilize the necessary capital for building dams to store the water and aqueducts to deliver it. Though irrigation and mining activities received most of the water, population growth meant that municipal demands also had to be served.

None of this should imply that water rights and markets are without defects. Resources had to be used to define and enforce water rights and to resolve disputes over those rights. Disputes continually arose over who was the first in time and what quantities of water were claimed. Water markets operated in a region

and time where information traveled slowly and risks were great. The architects of those water institutions were entrepreneurs in an evolutionary process that contributed to a working water market. The American frontier was an experiment in the evolution of property rights.

What Went Wrong?

Sometime since the late 1800s, changes occurred that have thwarted the market process in water allocation. William Schabb recently argued that:

markets capable of allocating water to satisfy all demands throughout the West have not developed, and one important reason is the prior appropriation doctrine itself. This doctrine, which was concerned primarily with new appropriations, ignored established uses. These private property rights became subject to supervening public controls; water rights, unlike land, were not freely transferable.

The problem, however, was not with the prior appropriations system but rather with the “supervening public controls.” We moved “from prior appropriation to economic distribution of water by the state.” As Schaab himself points out,

the solution to inadequate supplies was usually not purchase of existing rights but political efforts to obtain massive public investment programs to augment natural supplies with storage and distribution systems. As long as the government stood ready to finance such projects, significant private markets were not likely to develop.

The prior appropriation doctrine had the necessary ingredients for a viable market process, but state laws and bureaucratic policies “not only allow an inefficient use of western water, they insure it by reducing or eliminating the incentives and opportunities for transferring water to high-value uses” (Burness and Quirk). How did the transformation to centralized control take place?

Four arguments were used to justify governmental intervention into the prior appropriation system. First, it was argued that water was so unique that it required the government to control its allocation. This uniqueness “led to the near-universal view that private

ownership is unseemly or dangerous for a type of property so uniquely the common concern of all" (Hirshleifer, et al). As a result, the public trust doctrine frequently has come to be applied to water.

The second argument stems from a fear that private water supplies would constitute a natural monopoly, which would allow suppliers to charge high prices for the resource. William Smythe stated that fear clearly:

If we admit the theory that water flowing from the melting snows and gathered in lake and stream is a private commodity belonging to him who first appropriates it, regardless of the use for which he designs it, we have all the conditions for a hateful economic servitude. Next to bottling the air and sunshine no monopoly of natural resources would be fraught with more possibilities of abuse than the attempt to make merchandise of water in an arid land (Alston).

The great water explorer John Wesley Powell also was concerned with "the danger of an evil monopoly which would charge an exploitative price and force the homesteader to pay a heavy tribute" (Alston). Farmers were especially concerned that irrigation companies who charged a royalty or bonus for water would be in a position to refuse delivery of water and extract a monopoly payment. When Byron Wheeler of Colorado refused to pay the High Line Canal the royalty, and delivery was refused, Colorado farmers sought legislation to control canal companies. The State Farmer's Irrigation and Protective Association contended that corporate-owned canal companies were common carriers just like railroads and therefore could only charge a fee for transporting the water and that such a fee was subject to state regulation. This group contended that the monopoly position of canal companies was "choking the life" out of agriculture through "an extortion which is unbearable."

Such arguments won the day throughout the West and resulted in a morass of regulations governing water marketing. Viewed in retrospect, fear that the appropriation doctrine would result in water monopolies had little empirical basis. The fact that nearly 90 percent of the commercial companies were in financial distress by the turn of the century does not suggest an industry earning supernatural profits from monopoly. Further, those commercial companies that were the only suppliers of water to a region had only one group of buyers. This situation led to possibilities for a bilateral monopoly, where irrigation companies and farmers bargained over the price of water. Thirdly, if water companies were to execute monopoly power, they had to withhold their product from the market, an action requiring large storage facilities, which most companies did not have. Finally, when companies did try to exert their market power they ran the risk of competition. In one Montana valley where a ditch company attempted to raise its water prices, the farmers banded together and raised the necessary capital to construct an alternative ditch.

Potential competition of this sort is probably the most significant deterrent to market power.

Another reason given for support of nonmarket alternatives to water allocation was that capital markets were unable to provide the investment funds necessary for large projects. The fact is, however, that during the last two decades of the 19th century, entrepreneurs were actively organizing capital to develop water projects. This capital most often came from eastern cities or England. The Northern Colorado Irrigation Company, for example, constructed an 85-mile canal in the early 1880s at a cost of \$5.5 million in 1980 dollars with British capital (Dunbar). In addition to long canals, there are examples of dams as long as 2,000 feet, tunnels over one-half mile long, and aqueducts 40 feet wide with capacities of 2,500 cubic feet per second. Though not massive when compared to later Bureau of Reclamation projects, these were sizable projects funded by private capital.

By the turn of the century, many of the feasible projects had been undertaken. Alfred Golze stated that "while private enterprise had managed to bring under successful irrigation an impressive and substantial acreage of land, the point had been reached where further development would need stronger support by the federal and state governments." The reason this governmental support was necessary was that much of the further development was not economical. Entrepreneurs had organized capital and developed innovative institutional arrangements, such as mutual irrigation companies, to develop and deliver water. Given the remoteness of the West, capital markets were surprisingly well developed.

The last argument for governmental intervention in water allocation was that water use generated many third-party effects or externalities. To be sure, such externalities did exist in the emerging system of water rights on the frontier. However, many externalities were being taken into account. In the case of pollution from mining operations, the courts "issued injunctions when debris buried the claims of miners below, destroyed the growing crops of preemption claimants, filled irrigation ditches and poisoned their fruit trees, or split the houses of hydraulic miners downstream" (McCurdy). Externalities do present real problems for markets, but that argument was overused as a justification for governmental intervention in water markets, especially during the early years.

The combination of these arguments was powerful and led to much more centralized allocation of water. Backers of this position argued that

Federal control would promote "scientific" management of the land and water resources, simultaneously "conserving" and "developing" them; prevent the monopolization of water by corporations and "speculators"; streamline the system for establishing and enforcing water rights; and encourage the development of rural

democracy by war veterans and other deserving pioneers. These policies received the strong backing of at least three presidents including the two Roosevelts and Herbert Hoover (Cuzan).

Even though some courts opposed “using the organized power of the community to divest the equitably acquired claims of men who had evinced a growth inducing ‘incentive to improvement’ ” (McCurdy), inefficient restrictions were being placed on the doctrine of appropriation by the late 19th century. The laws that evolved in the mining camps and common law courts recognized prior appropriation; western state constitutions and statutes, however, were moving toward the establishment of the public ownership of water. When the Colorado Constitution was drafted on December 20, 1875, it declared all unappropriated water “to be the property of the public.” Under such public ownership, appropriators receive only a usufructory right, not an actual ownership right, so state legislatures have been free to declare that the *corpus* was state property.

And, as the demands on water resources grew, courts and legislatures got more and more involved. Some of this involvement brought better requirements for the filing of new claims and adjudication of existing claims.

But other legislation interfered with water marketing. The Wyoming system meddled the most with the doctrine of prior appropriation and the possibility of transfers. Elwood Mead, an active advocate of governmental involvement in water projects, was primarily responsible for the legislative reform in Wyoming. Under his direction, legislation was passed that attached water to specific land tracts, disallowed ownership of water by canal companies if they did not actually own the land their water was irrigating, and regulated canal company water rates. Some states gave irrigation districts the power to tax and provided subsidies for canal construction. Many states specified what uses were beneficial and gave preference first to domestic, then to agricultural, and finally to manufacturing uses. These preferences, along with restrictions on interbasin and interstate trades, have restricted transferability of water rights and effectively thwarted the market process.

Judges have also contributed to the erosion of the prior appropriation doctrine by failing to abandon the common law precedent of riparian rights. Some elements of the riparian doctrine led directly to more public control of water allocation. First, with riparian ownership the resource is held in common, requiring regulation on open access. Second, since uses that were prejudicial to other owners required “license, grant or prescription,” users naturally sought and obtained these preferences through legislation. The resultant mixture of riparian with the prior appropriation doctrine led to a confusion that stifled the effective establishment of

private water rights. Without private property rights, the confusion could only be resolved through legislation and administration.

A doctrine that had evolved through the spontaneous order and decentralized actions of miners and irrigators was slowly degenerating to the status of state-controlled permits and licenses. As early as 1929, one legal scholar declared that the principle of appropriation had reached its zenith (Lasky). The water rights that evolved in the quasi-anarchistic setting of the frontier were replaced by permits to use state-owned water, with decisions on water use ultimately determined by state officials. Lasky argued in 1929 that:

Prior-appropriation has been dying for 50 years.

... In 1903 Professor Mead declared it dead in Wyoming. How much more is this declaration true today—throughout the entire irrigating West? The administrative mechanism constructed to enforce it has been an instrument in destroying it! ... We have left behind a system of individual property rights in water and are fast approaching a system of economic distribution of (perhaps state-owned) water by a state administrative machinery under state-granted conditional privileges of user.

Salvaging the Appropriations Doctrine

The belief that the doctrine of appropriation contains a great deal of potential for market failure appears to be unfounded. Water quality and instream use do generate some special problems (Anderson, 1983a), but a system of well-established and transferable property rights generally promotes efficient water allocation. The allocation problems in many western states are not the fault of the doctrine of prior appropriation as much as they are the fault of restrictions placed on water markets. Administrative agencies and courts continually interfere with what constitutes a water right and, hence, with the definition and enforcement of those rights. Furthermore, nearly all states restrict transfers through the judicial or administrative process.

The prior appropriation doctrine could be salvaged if many of the restrictions on transfers were removed.

When the diversion and use of water cannot be changed, high valued alternatives are foregone at a cost to both the water owner and society. Burness and Quirk assert "that often what appears to be a shortage of water is actually the manifestation of restrictions on water rights transfer." The Metropolitan Water District (MWD) in Southern California stands to lose large quantities of water since it has low priority rights in the Colorado River. If water rights were transferable, however, much of this shortfall could be made up by conservation measures in the Imperial Irrigation District (IID). The problem is that "existing California statutes preclude the transfer of water outside irrigation districts; one would hope enabling legislation would be quickly forthcoming. . ." (Burness and Quirk).

Pressure for such transfers is now being applied by the MWD and the Environmental Defense Fund (EDF). A study by the latter has shown that water efficiency in the Imperial Irrigation District can be increased so that approximately 450,000 acre-feet of water per year can be conserved (Stavins). These conservation techniques would include the construction of more efficient irrigation facilities and different irrigation management practices. The physical improvements would include lining canals, expanding seepage recovery systems, constructing more regulatory reservoirs, expanding electronic control, and providing more flexible deliveries. On-farm improvements would include expanding the use of tailwater recovery systems and improving irrigation techniques regarding leach water (Stavins). The EDF study shows that the MWD could finance the improvement in return for the water.

There are three likely arguments against allowing such a transfer. First, it is often held that if an irrigation district is "wasting" its water, it should not have a legal claim to that water in the first place. Some would interpret an agreement by the IID to these improvements to suggest that it has been wasting the water. Second, the IID's contract with the Department of Interior says that "water shall be delivered as ordered by the district, and as reasonably required for potable and irrigation purposes within the boundaries of the district," making any transfer out of the district an abrogation of the contract. Therefore, such a transfer must be approved by the Bureau of Reclamation. Finally, the irrigation districts are not allowed to profit from the sale of water delivered from federal irrigation projects. Having costs paid by the MWD would allow the farms to "profit" from the transfer.

This example immediately brings to mind several possibilities for encouraging the market process in water allocation. Bureaucracies at all levels could remove restrictions on transfers. Eliminating beneficial use requirements, allowing profitable transfers, and removing prioritized use limitations would make rights more transferable. As argued above, it is impossible for

bureaucrats and politicians to obtain accurate information to determine which transfers are efficiency enhancing. It is market transfers themselves that reveal subjective value and force a careful weighing of trade-offs.

Two recent Supreme Court cases suggest that courts are recognizing the importance of transferability. In the *Sporhase v. Nebraska* case the Supreme Court ruled that the commerce clause of the Constitution forbids the state of Nebraska from preventing the transfer of water into uses in Colorado. Following this decision, the Supreme Court ruled in *El Paso v. Reynolds* that New Mexico could not restrict the export of 296,000 acre-feet of groundwater out of New Mexico into Texas (Utton). More strict adherence to the commerce clause should further enhance the market process in water.

Another recent decision, *Colorado v. New Mexico*, however, works in opposition to water markets. In this case the lower court found that a late claimant on the Vermejo River, which flows from Colorado into New Mexico, could withdraw 4,000 acre-feet per year even though the river was fully appropriated in New Mexico. The special water master in this case found that an irrigation district in New Mexico was not using its water efficiently and therefore was not "materially affected" by the Colorado diversion. This example offered a perfect case where water markets could have solved the allocation problem. If the Colorado River Fuel and Iron Steel Corporation valued the water highly enough, it could have purchased that water from downstream users. The Supreme Court ruled that when "both states recognize the doctrine of prior appropriation, priority becomes the guiding principle, but not the sole criterion, in determining an equitable apportionment." By allowing priority to rule, the court could have encouraged market allocation. Instead, the potential for more political conflicts through the doctrine of equitable apportionment was encouraged.

As stated above, third party effects cannot be ignored. One of the main problems is that water is used and reused along the course of the stream. The return flows become water for downstream users. If an upstream user increases his consumption or if a downstreamer transfers his diversion upstream, return flows will be diminished. To eliminate this potential third-party impairment, the state of New Mexico has basically defined rights in terms of consumption rather than diversion (Gisser and Johnson and Tregarathen). Such an improvement in the definition of water rights can significantly enhance the potential for water markets.

Salvaging the appropriation doctrine does not require new institutions but, rather, the elimination of existing restrictions on the market. The problem is that existing bureaucratic agencies lose power when allocation is turned over to the market process. For water markets to develop, ideas must change and new political coalitions will have to reduce the power of bureaucracies.

CONCLUSION

With the possibility of continually expanding water supplies "drying up," more emphasis must be placed on coordinating existing demands and supplies. The U.S. Geological Survey recently warned in its "National Water Summary" that shortages are likely to occur in some of the southern and central High Plain states, in the Colorado River Basin, in southern Arizona, and in the Central Valley of California. The shortages, of course, are a reflection of the fact that water prices are being kept too low. In economic terms, a crisis exists when the quantity demanded is greater than the quantity available and when there is little time to adjust either of them. This is exactly what the energy crisis was, and is exactly what the water crisis will be. Governmental agencies have responded by attempting to constrain demand, ration water, and increase available supplies. The supply projects have been extremely costly, and it is questionable whether funds for them will continue to be available. Without a price mechanism operating on water supply and demand, crisis situations will continue to arise, and political conflicts will become more prevalent.

There simply is no substitute for the market process. As demands grow, the allocation problems and the necessary information to solve them become more and more complex. It will be impossible for special water masters or state water engineers to perform a balancing act. At the same time, however, hydrological models of water basins and computer capacity lead some to conclude that centralized planning is more feasible. William Schaab concluded that basin models can perform the foundations of an effective market to allocate water among those who need it. The model will organize the essential market information concerning the geohydrological reality (the supply) and the existing water uses (the demand); it will specify the interests that must be "purchased" (the incremental impairments) and provide a basis for establishing a price (the indemnity). The deals that result will not be free of coercion. . .

This conclusion misses the essential nature of the market process. Inserting geohydrological reality into the model does not give us any information about economic supply. The concept of supply depends on opportunity costs which in turn depend upon subjective values of market participants. There is no way that these values can be put into a basin model. Furthermore, knowing the existing water uses gives us little information about the economic demand. We cannot predict the alternative uses for water and the value in those uses. Such predictions depend upon the perceptions of entrepreneurs again making it impossible to model. Without demand and supply, establishing price is inconceivable. Finally, to suggest that models can form the "foundation of an effective market" but that the results "will not be free of coercion" is a contradiction in terms. The market is a coordinating process wherein bargaining for mutual consent exhausts the gains from trade. Coercion is a characteristic of a political solution to water problems that is what generates conflict rather than cooperation. Hydrological models at best provide us with a snapshot of a water basin at a point in time. To coordinate demands and supplies requires a moving picture, and this is what the market process is.

Unfortunately, it is true that "all things considered, the interplay among existing and new users, administrators, scientists and engineers, courts and lawyers, and structured markets is more promising than at the creation of water bureaucracies 75 years ago" (Schaab). It is not the interplay of these actors in a structured market that will solve most of our water problems. Though some third-party effects must be addressed through the courts and legislatures, a majority of water allocation problems can be handled through the market process. Until we recognize this and do something about it, we will be faced with conflict rather than cooperation in market allocation.

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Ted Doney

THE MONTANA PERSPECTIVE: A RESPONSE TO ALTERNATIVE POLICY STRATEGIES FOR WATER MARKETING

The purpose of this paper is to provide a "Montana perspective" on the three alternative policy strategies on water marketing presented by Dr. Terry Anderson, the Honorable Ronald Robie, and Dr. Lee Brown (the latter in conjunction with Mr. Gilbert Bonem). First, however, to understand the three strategies, a reiteration of the current situation in Montana is necessary.

Unlike most western states, Montana is a water abundant state. Over 40 million acre-feet of water flow out of Montana on the average each year. Depending on how one defines the term, we have a "surplus" of water in Montana. This doesn't mean, necessarily, that we have an abundance of unused or unappropriated water, but that there are other uses for which some of the water

flowing through our state could be put without having any significant impact on existing uses. And, more to the point of this paper, there are "surplus" waters available for marketing for out-of-state uses, perhaps over one million acre-feet per year.

As in seven other western states, the appropriation doctrine of water law applies in Montana.¹ The doctrine governs the acquisition and exercise of water *rights* to appropriate water under *state* law. It does not apply to all situations, however. For example, federal reserved water rights are created under federal law, not under the Appropriation Doctrine.

In its pure form, the doctrine provides that anyone (an individual, a company, the state, the federal government, etc.) may acquire a legally protected right to use water if he appropriates it and puts the water to a beneficial use.² Each water right may be exercised in the order of its priority ("first in time is first in right"), which is calculated from the date when the water was first used. A junior priority right cannot be exercised so as to impair the exercise of a more senior right. The water right is a *right* to use water, *not an ownership* in the water itself. It is a property right, and therefore entitled to the constitutional guarantees of due process as are all other property rights. The right can be freely transferred to anyone else. However, the purpose of use, point of diversion, place of use, or method of transmission of the water appropriated pursuant to the right cannot be changed if other rights (senior or junior) are impaired.

That basic system is still the law in Montana. Until 1973, in fact, anyone could acquire water rights by either getting them from someone else or by appropriating water for a new right, without any notice or agency approval whatsoever. Now, with the enactment of the Water Use Act in 1973, an administrative approval system is superimposed on the Appropriation Doctrine, whereby new water rights and changes in water rights must be first approved by the DNRC. However, the substantive appropriation doctrine law is basically the same; only the *procedure* to acquire and change water rights has been changed.

Insofar as water marketing is concerned, there is nothing in the existing law that prohibits the marketing of water *per se*; individuals, districts, companies, the state, and the federal government are marketing (selling) water to others in Montana today from numerous water projects. The only significant *legal* restrictions on the marketing of water are that water cannot be used for coal slurry purposes,³ that new appropriations by water right permits over 10,000 acre-feet a year or 15 cfs must first meet stringent criteria in addition to the usual criteria under the Appropriation Doctrine and be ratified by the Legislature,⁴ and that water cannot be transferred from the Yellowstone Basin without the consent of Montana, Wyoming and North Dakota.⁵

With this context in mind, let's look at each of the three proposed strategies.

Anderson Free Market Strategy

Dr. Anderson's stimulating paper advocates a "free market" approach to the allocation of water. However, it is not clear to this author whether Dr. Anderson is advocating an absolute free market, or a modified free market. Nor is it clear whether a free market in water *rights* is advocated, or a free market in water *ownership* (the two are quite different, as will be explained). Essentially, though, it appears that Dr. Anderson advocates the removal of all legally imposed restrictions and impediments to the appropriation and use of water, whether they come from the statutes, the constitutions or the courts.

The dilemma of the free market approach is that it cannot satisfactorily answer the concerns of the vast majority of people who believe that the public interest is often more important than private economic gain. The assumption seems to be that a free market will automatically result in the public interest being served. It is this author's considered opinion and experience that such an assumption is very unrealistic and naive, particularly in the fields of water use and allocation.

Montana essentially had a free market system in water rights prior to 1973. Water rights could be acquired, bought, sold, transferred or changed at will, with two minor exceptions. Of course, the requirements of the appropriation doctrine applied, which Dr. Anderson implies are also impediments to a free market.⁶

Utter chaos resulted. There was hardly any documentation available on who owned water rights, so no one knew if water would actually be available for appropriation when needed. Thus, it was almost impossible to make an informed decision regarding the economic feasibility of a water development project. To resolve disputes over water rights, litigation abounded, never with any final resolution. One stream even went to the Montana Supreme Court 11 times, and it still was not settled.⁷ The expense to protect one's rights in the courts was considerable, and in many cases prohibitive. So much for a free market!

The Water Use Act of 1973 was enacted to bring order out of this chaos. The basic appropriations doctrine was retained, but henceforth prior water rights would be protected by requiring DNRC approval, applying the doctrine's criteria, before new rights could be acquired. The same was true for changes in water rights. Litigation immediately declined. And, thanks to the Water Use Act and amendments to the act made in 1979, potential water developers can now ascertain with some certainty whether or not water will be available to appropriate, and thus whether an investment to appropriate water is an economically wise decision. So we can see that some state regulation in this area has actually *facilitated* the marketplace.⁸

How the free market approach advocated by Dr. Anderson applies to water marketing is also unclear. Should anyone be allowed to sell water to anyone for out-of-state use? That in fact can be done today, except for coal slurry use, albeit with some considerable hurdles, depending on the amount of water to be appropriated. Should anyone be allowed to transfer his water *right* to market water to anyone else? That can also be done, with the same caveats on the actual use of the water. But of course it's unlikely that anyone could or would want to buy the water right for Fort Peck Reservoir for example, or even that the federal government would sell it. And, should the ownership of all water be transferred to private hands?

This last question stems from the confusion in Dr. Anderson's paper between water rights and water ownership. It is therefore difficult to tell exactly what is being advocated. However, it is obvious that the transfer of ownership of all *water* to private hands is politically impossible. It is also legally impossible. Most water *rights*, on the other hand, are already in private ownership.

In Montana, the water flowing in our streams and held in the ground is "owned" by the state. The Montana Constitution claims as much.⁹ This has probably always been the case anyhow or nearly so in effect, because early on it was determined by our Supreme Court that water was subject to the control of the state, and *publici juris* (in the jurisdiction of the public).¹⁰ Whether the water is actually "owned" by the state in a legal sense is probably unimportant. However it is clear that it is not owned by anyone else, and that the state can control its use. There are some exceptions to state control, though, where the federal government and Indian reservations are concerned, and in other instances.¹¹

As has already been noted, appropriators acquire only rights to use the water in Montana. But those rights are property rights, entitled to full legal protection as such. So, if one wanted to transfer the "ownership" of water to private hands, those water rights would still have to be protected. Therefore, either existing water right holders would still be entitled to use the water as they always have or they would have to give them up

voluntarily or be compensated for them if the "owner" of the water wanted to regain total control of the water so he could market it freely. To accomplish all this politically, legally or even practically is difficult to imagine.

Certainly the Montana Constitution would have to be amended where it requires the legislature to "provide for the administration, control, and regulation of water rights and [to] establish a system of centralized records. . . ."¹² In addition, the Water Use Act would have to be repealed and court adjudication of our water rights would have to be stopped. Finally, somehow all water rights and ownership in the corpus of the water itself would have to be transferred to private hands. This latter requirement presents another interesting problem. It has been made clear that water is held in trust for the public by the state (the public trust doctrine). Our own Montana Supreme Court recognized the doctrine for the first time in its recent decision in the *Curran* case.¹³ In this author's opinion, the public trust doctrine would flatly prohibit the transfer of water ownership to private hands, even by an act of the legislature.

However, even if all the legal hurdles could be overcome to accomplish a free market, the fundamental problem with the free market approach is still that it fails to protect Montana's interests. Montanans simply will not accept the purchase and/or development of Montana's surplus water by large out-of-state interests without some assurance that Montana's existing and future needs will first be guaranteed, that farmers' and ranchers' water rights will not be sold to the highest bidder, that pipelines and canals will be sited and constructed in a socially and environmentally sound manner, and that all the other myriad of concerns to Montana will be adequately addressed. Dr. Brown said it well in his paper; there is a community interest in water, as well as a commodity interest.

Robie State Development Strategy

Contrary to the free market strategy presented by Dr. Anderson, Judge Robie advocates a strong leadership

role by state government in water marketing. Drawing upon his considerable experience in a state that does exactly that, Robie suggests that the state itself serve as the project developer of any facility to transfer water out of the state so it can best control water marketing in the state's interests. As a part of that strategy, he emphasizes the importance of generating realistic data to ensure that the future water needs of the "area of origin" are met before water is transferred from that area; he further advocates that any state-developed water marketing program should include financial benefits to local government.

Legally, little change in the existing law would be needed to accomplish Judge Robie's scenario, except the following:

1. Removal of the ban on use of water for coal slurry;
2. The enactment of a mechanism to ensure that the state would have the exclusive right to develop water for transfer out of state, if this is desired. Constitutional problems with this mechanism would be encountered;
3. Setting up a funding mechanism for local government.

Under current law the DNRC already has the authority to construct water development projects. It can market water for out-of-state uses, except for coal slurry, and it can do this without legislative approval if no new water permits are needed. It can sell the water for what the market will bear, but those funds must be deposited in an earmarked fund, so they could not be transferred to local government without authority to do so. (However, it would be possible to require a purchaser of water from a state-developed project as a condition of purchase to fund projects to meet local needs.)

In the opinion of this author, Judge Robie's suggested strategy has considerable merit. The DNRC has actually investigated the idea in the development of plans to rehabilitate the Tongue River dam. Not only would the state have more effective control over what water transfers took place, and in what manner the development projects were built, but the desires and concerns of Montanans should be more adequately addressed because the DNRC is politically accountable, through the governor and the legislature, for its actions.

Judge Robie's suggested strategy is not without its problems, however. One of the main ones is that state government historically has not done a particularly admirable job in developing water resources through its own water projects. Many of them were built with little thought given to their economic feasibility and long-term maintenance. Dr. Anderson's assertion that government has financed many uneconomic water projects is certainly true in Montana.

Brown/Bonem Community Strategy

The "community" strategy advanced by Dr. Brown and Mr. Bonem also asserts that state control of water marketing is desirable. After cogently listing the disadvantages of a free market system, their thoughtful paper argues that at least as to water there is a community interest which transcends a pure free market, and the state should consider actually "appropriating" some surplus water itself for eventual marketing for out-of-state uses so that the community interest will be better served.

The Brown/Bonem strategy can be accomplished under existing law, except that again the ban on water for coal slurry would have to be removed. In addition, legislation may be needed to enable the state to sell its appropriated but nondeveloped waters.

These are basically three methods by which the state could "appropriate" water to control its use. One is by the state itself building the water projects to transfer the water—the Robie strategy. The second is by acquiring the right to market a block of water by obtaining a permit or a water reservation (a water right) and then selling the water obtained thereby. This probably cannot be done under existing law unless a physical diversion or impoundment were also constructed by the state. The third method is by acquiring the right to market a block of water from a reservoir for which the water right is held by a third party.

All three of these methods are already being pursued to one degree or another. The first method has been discussed earlier in this paper, and is being investigated on the Tongue. The DNRC has reserved water in the Yellowstone Basin for the Tongue Reservoir, which has the effect of combining the first and second methods. And the DNRC has the right by contract to market 300,000 acre-feet of water from the federally owned Fort Peck Reservoir; a similar contract is being negotiated on the Yellowstone Reservoir.

The Brown/Bonem strategy also has merit. Like the Robie strategy, the interests of Montana (the "community") will be more adequately addressed through some degree of state control.

CONCLUSION

All three proposed strategies deserve further discussion. While in the opinion of this author the Anderson free market approach is thought provoking, it is unrealistic to accomplish, both politically and legally. But more importantly, the short- and long-term interests

of Montana cannot be adequately met in a free market. The Robie and Brown/Bonem approaches more closely take into account the state's interests, provincial as they may be, and they would involve considerably fewer legal changes to accommodate them.

FOOTNOTES

1. The other states are Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming. The riparian system of water rights has never applied in Montana. *Atchison v. Peterson*, 1 Mont. 561, 569 (1872), aff'd, 87 U.S. 507 (1874); *Mettler v. Ames Realty Co.*, Mont. 152, 201 P. 702 (1921).
2. The federal government, of course, can acquire water rights or appropriate and control water by other methods.
3. 85-2-104, MCA. The ban on using water for coal slurry is a statutory ban, not a constitutional ban as stated in Dr. Anderson's paper.
4. 85-2-311, MCA.
5. Article X, Yellowstone River Compact, 85-20-101, MCA.
6. One of those is the requirement of beneficial use, the basis and measure of an appropriation water right.
7. Dempsey Creek. See Stone, The Long Count on Dempsey: No Final Decision in Water Right Adjudication, 31 *Mont. L. Rev.* 1 (1969).
8. In 1975 an amendment was made to the Water Use Act which prohibits changing an agricultural right of more than 15cfs to an industrial use. This provision is obviously an impediment to a free market. 85-2-402(3), MCA.
9. Article IX, Section 3(3), 1972 Montana Constitution.
10. *Mettler*, supra note 1; *Rock Creek Ditch & Flume Co. v. Miller*, 93 Mont. 248, 17 P.2d 1074 (1933).
11. These exceptions include federal reserved water rights, and the exercise of the navigation servitude, among many others.
12. Article IX, Section 3(4), 1972 Montana Constitution.
13. *Montana Coalition for Stream Access, Inc. et al. v. Curran*, 41 St. Rptr. 906 (1984).

SUMMARY OF THE POLICY TOOLS RAISED IN THE LINCOLN SEMINAR PAPERS

We can examine the policy tools discussed in the papers in terms of their likely effects in the three categories discussed earlier: upstream/downstream, consumptive/instream, future needs/present uses. This is by no means an exhaustive list, but it helped illustrate the kinds of tradeoffs that Montana should be considering.

One package of options could work like this. Montana could settle a water conflict with downstream states via a compact. This settlement would allow Montana to adopt measures to determine the best use of its water instead of turning to measures that are merely

intended to protect water from downstream users. Second, the state could determine the instream flows that ought to be reserved for recreational, health and ecological values. Third, the remaining water available for consumptive uses could be sold to the highest bidder. Thus, all three areas of concern are addressed.

This example might show the strengths or weaknesses for one tool in one instance; another situation might call for a different policy tool or combination of policy tools. The matrix presented here shows how these tools can be used in the name of maximizing the state's control over its water supplies.

Water Policy Considerations

Policy Tools	Upstream/ Downstream	Consumptive/ Instream	Future Needs/ Present Uses
Compacting	the most direct way to divide a basin's water between upstream and downstream states	once accomplished, this approach allows a state to allocate available water within the state, as it wishes, to either consumptive or non-consumptive uses	this approach may be viewed as the best guarantee for future consumptive uses of the state's share
Water Development	clearest way to establish senior water rights upstream (could accelerate compacting)	this process tends to conflict with instream flow values	arguably the best way to claim water that will be needed later
Water Marketing	the sale of water implies establishment of a senior water right that will likely be challenged by downstream states	if marketed from existing impoundments, may not draw down stream flows significantly	leasing could be an important hedge against future shortages; need "dry year" protection
Reservations	instream flow reservations create no downstream conflict; consumptive reservations as part of a water development plan could create conflict when put to use	within the state, the reservation process allows water to be reserved for either consumptive or instream purposes	allows water to be claimed for future needs while protecting existing uses
State Appropriation	state appropriations may substantiate a claim to future consumptive uses against downstream claimants; must be valid part of water plan	the state appropriation may perform in the same way as a reservation system	like a reservation system, this approach provides a greater flexibility for transferring water between present and future consumptive claims
State Market	may be a tool as effective as the "use-it-or-lose-it" philosophy	could tend to increase consumptive uses, especially if it underprices water	could tend to reserve water for future uses if it overprices water
Free Market	could tend to release the appropriate amount of water to downstream states	probably would not assign high enough value to instream flows	rights fully transferable to future uses
Severance Tax	could help to conserve water that becomes available for downstream uses	could help to conserve instream flow	could help to conserve for future needs
Public Trust Doctrine	does not directly address this division except that the application of riparian principles upstream guarantees greater downstream flows	the basis of a coherent water permitting system that differentiates between water in its public (non-divisible) uses and its private (consumptive uses)	could limit future consumptive claims

THE COLUMBIA RIVER BASIN

INTRODUCTION TO COLUMBIA BASIN ISSUES

Montana straddles two distinct precipitation regimes: the upper reaches of the Columbia River Basin in the west and the Missouri River Basin in the east. The Missouri drains more area in Montana than does the Columbia, yet more water leaves the state flowing westward in the Columbia than eastward in the Missouri because of greater snowmelt and rainfall in the west.

Differences in land size, topography, economic practices and human activity result in more demand for water to put to consumptive use in eastern Montana. Accordingly, the state has first addressed competing water claims in the Missouri system. One should not infer that there are no limits west of the divide, only that the nature and timing of the conflicts are different.

The western slopes see more intensive land development, mining and industrial activities than the eastern slopes. This means that the growing concern for water consumption in eastern Montana is paralleled in western Montana by a growing concern over water quality. Mine spoils, industrial wastewater, erosion from timber and farmland practices, and the impacts of

subdivision and second-home development all combine to elevate concern over water pollution in Columbia River tributaries.

The list of concerns already discussed in the Missouri River Basin section are also valid in the Columbia River Basin. But each of these concerns is less complex in the Columbia than in the Missouri. Fewer problems strictly attributable to water shortages are likely to arise on the west slope because it has greater precipitation. Consequently, there is less prospect for new downstream water demands that might occasion the diversion or sale of Montana water or, for that matter, preclude water development in Montana. Great debate over consumptive uses of water is unlikely to occur in western Montana.

Competition among alternative instream uses on the Columbia is the most intense problem facing the basin. Arguments continue over maximizing electricity production versus enhancing fish and wildlife habitat, as well as general water quality concerns. This section explains several of those conflicts.

NORTHWEST POWER PLANNING COUNCIL

Compacting has been discussed as one of the alternatives to protect Montana's share of Missouri River water in anticipation of disagreement with downstream states. The Yellowstone Compact, involving Montana with Wyoming and North Dakota, has given Montana some experience with compacting. So has the recent experience with the Northwest Power Planning Council (NWPPC), although even knowledgeable

observers are generally unfamiliar with how the council's mandate extends to aspects of water use or to electricity planning in the Columbia River Basin. A discussion of some of the features of the NWPPC that pertain to water issues can aid in comparisons among the compact planning process and alternatives proposed for the Missouri Basin.

As a headwaters state in the Missouri River Basin,

Montana needs to deal with the concerns of nearly a dozen other states that believe they could be affected by water decisions made in Montana. Additional states could become involved if plans to transfer water outside of the basin materialize. In addition to the states, federal interests are at stake and powerful federal agencies are involved in current management decisions and prospective policy options. The picture is complex as one considers the various options, including compacting, litigation, congressional apportionment of water and interbasin transfers.

A similar pattern faces Montana with the Columbia River Basin. In the Columbia, only three other states — Idaho, Washington and Oregon — are directly involved, but the Canadian province of British Columbia in the

headwaters makes the situation more complex.

Apportionment of water among the states is not the principal concern, although if plans to divert water to the southwest United States materialize it could be. As with the Missouri, federal agencies have a crucial management role in the Columbia and are pivotal in the operation of compromises adopted in the Pacific Northwest.

An examination of the NWPPC as a regional mechanism for addressing Montana water concerns is itself interesting and important. The search for solutions in the Missouri Basin is not without precedent for Montana decision-makers, as shown in an analysis of select aspects of the Columbia Basin regional compromise.

HISTORY OF COLUMBIA RIVER HYDRO DEVELOPMENT

Harnessing the 1,200 miles of Columbia River has been a goal of engineers, planners and public officials since the nineteenth century. Their motives were evident: vast potential for the multiple benefits of electricity, irrigation, flood control and navigation. The Great Depression brought an opportunity to build the first large mainstem dams — the Bonneville and the Grand Coulee — as public works projects. A great transfusion of public investment was the key to economic turnabout in the Pacific Northwest and the start of decades of prosperity.

Some critics charged that the multi-million dollar dams outmatched the sparsely populated region's need for electricity. The dams became a self-fulfilling prophecy, however, as people and industry were attracted by the low power rates. The population influx, in turn, increased the demand for power and the need for more dams. Demand for aluminum in World War II accelerated the process. The result was a steady succession of federal and private dams, all tied together by the federal government's marketing agent: the Bonneville Power Administration (BPA).

The potential for energy production was considered unlimited. J. D. Ross, the first administrator of BPA, was widely quoted as calling the Columbia "an oil well

that would never run dry" and a "coal seam that would never thin out."

Individual dam sites were chosen in accordance with cost-effective selection criteria, moving from the most attractive to least attractive sites. Under the terms of the 1964 Columbia River Treaty, Canada built several dams in the upper reaches of the Columbia, not for power generation, but to store water to increase the efficiency of U.S. dams downstream. The network of dams on the Columbia was operated to optimize hydropower production for the entire international region.

Each successive dam continued the cheap hydropower, giving area residents the lowest rates in the nation. Power rates actually declined for many years. Within three short decades, however, more than 50 dams had been built and nearly all of the suitable dam sites exhausted.

The dam system had been expanded to near capacity with virtual indifference to the cost to fish runs. The loss of fisheries were not explicitly compared with the benefits of the hydropower system expansion. The loss of fisheries habitat was also a measure of the ecological health of the entire river system. These externalities of hydropower production remained hidden, in part because of lag between cause and effect.

Evolution of Power Shortages

Hydropower production came to dominate multiple-use planning in the Pacific Northwest because cheap electricity was the key to steady economic growth. Sustained prosperity was linked to the continued availability of electricity in the minds of planners and consumers alike. The dams for hydropower provided benefits easily measurable, while costs were disguised, deferred or not easily defined.

The construction of each new dam was followed by rising demand for power. Power planners came to believe that this was a natural law of supply and demand. After the river system had yielded its suitable hydro sites, an ambitious Hydro-Thermal Power Program was introduced in the late 1960s in the state of Washington. It called for construction of 20 nuclear plants and two coal plants over the following two decades. Without this program, it was widely believed, electricity demand would eventually exceed supply and imperil economic prosperity.

Expensive coal or nuclear plants can seem affordable if their costs are disguised by using average or "rolled in" rates to consumers. This means that customers are shielded from paying the high marginal cost of the new power. BPA provided "net billing" agreements to the sponsors of three nuclear plants (Washington Public Power Supply System 1, 2 and 3) which allowed their costs to be melded with the costs of cheap hydropower from existing dams. A large base of cheap hydro allowed the addition of high cost plants because average costs rose slowly. This subsidy made these expensive thermal plants seem viable. The need for new thermal plants in the region was self-fulfilling because underpriced electricity induced additional demand.

As rates rose to pay for the nuclear plants, demand for power fell. Declining load growth meant that the new plants would not be needed and that their continued construction would have to be reflected in higher rates. Consumers faced the vicious conservation paradox: using less electricity resulted in higher rates.

Concern arose over how to pay for the new plants. Project sponsors turned to Congress for guaranteed financing. They were followed to Washington, D.C. by a chorus of critics who argued for three years. Finally, Congress passed PL 96-501, creating the Northwest Regional Power Planning Act and its council to address the problem.

THE NORTHWEST POWER PLANNING ACT

The regional council is composed of eight members, two appointed by each of the governors of Washington, Oregon, Idaho, and Montana. It is directed to create an independent forecast of electricity demand and a plan to develop the resources to meet the demand. BPA must follow the council's resource acquisition plan or return to Congress for special permission to depart from it. Senator Mark Hatfield called the act creating the regional council "the most important piece of legislation to affect the Pacific Northwest since the 1937 Bonneville Project Act."

The act instructed the council to give priority to conservation and renewable energy sources over coal and nuclear in its selection of resources to be included in the plan. In fact, the cost-effectiveness of conservation is to have a 10 percent premium over any other acquisitions. In addition, the council is supposed to consider environmental costs whose exclusion in the past has given thermal plants a hidden advantage.

Complex motivations lay behind the compromises achieved in PL 96-501. The act meant many things to many people. It was supposed to: guarantee that the region would not "run short" of electricity; ensure that the costs of expensive new power plants would be underwritten by BPA; guard against overbuilding power capacity and allow only the cost-effective development of electricity; ensure continued access to electricity for consumers; expand access to "preference power" to some new users; provide a way for the states to rein in the powerful BPA; give citizens a greater say in policy; and properly account for the side effects of power production on fish and wildlife.

One group in the congressional battle, led by WPPSS sponsors, wanted "business as usual." That meant strengthening the BPA mandate and obtaining assurances that the nuclear plants would be built and markets would be guaranteed. An alliance of environmentalists was concerned primarily with

restraining BPA's proclivity to build a bigger power distribution complex and desired a mandate to conserve energy. The interlocking utility network (public and private) had its own substantial prerogatives to protect, but it realized that federal authority — and BPA resources — would be necessary for an acceptable solution. Downstream states had different motives than upstream states. Washington, with a public utility system, and Oregon, with a private utility system, were divided by their differences. But all parties recognized

that the solution transcended the states. There was no avoiding a federal role.

On the other hand, there was no interest in telling Washington, D.C. that the states could not manage their problem or in giving BPA a longer leash to solve it. The common interest in avoiding federal preemption resulted in establishment of the regional council. Despite an inequality in stakes among the four states, this common interest led to an egalitarian solution of four equal-sized delegations.

FISH AND WILDLIFE

Although the early dams provided multiple benefits to the region, early planners gave little thought to the costs borne by the natural environment in such terms as fish and wildlife habitat. Most dramatic was the impact upon the anadromous fish, which need to migrate upstream to spawn.

The decline of the anadromous fish harvest in the Columbia River Basin was documented over several decades. The fish harvest had been cut from 36 million pounds in 1920 to 10 million in the 1950s and to seven million in 1980. Several factors combined to produce the decline, and it is difficult to calculate the degree of blame that should be assigned to the hydropower dams. One known reason for the decline was overharvesting in the oceans; another was intense fishing pressure on the remaining fish in the Columbia. But much of the problem could be attributed to the multiple impacts of dozens of mainstem and tributary dams.

The Columbia River became largely a consecutive series of tail ponds behind dams; the dams slowed the river's flow to a virtual standstill. The backwaters destroyed an estimated 50 percent of the spawning habitat. Nearly all of the upper basin in Montana, Idaho and Canada is shut off from the salmon runs by the Grand Coulee and Hells Canyon dams. The dams pose formidable barriers to the upstream and downstream passage of fish. An average of 15 percent of the fingerlings passing through turbines at each dam are killed.

wildlife in the final compromise were remarkable. In principle, the act requires federal water managers to treat power and fish equally for the first time. The act requires the council to adopt and implement a program to "protect, mitigate and enhance" fish and wildlife dependent on Columbia River habitat. The program must include measures that are technically feasible and economically effective, even if they diminish power production. This was not a welcome directive to some, considering that the primary thrust of the act was to alleviate expected power shortages. The fisheries interests had prevailed upon John Dingell, chairman of the House Commerce Committee, which controlled the fate of the bill. Dingell let it be known that no bill would emerge that omitted protection for fish.

Proposed Remedy

Congress set a fish run recovery target but gave the council great flexibility in achieving it. The following general proposals were made to help restore the fish runs:

- (1) increase natural production through the revitalization of spawning grounds;
- (2) increase fingerling production to augment the natural fish runs;
- (3) maintain minimum or even "optimum" stream flows to hasten the migration of fingerlings to the ocean;
- (4) install screens around turbines or place conveyances to help fingerlings avoid being chopped in turbine blades;
- (5) construct fish ladders to help adult salmon move upstream.

The council faced two important questions: What is

Fish and Wildlife Compromise

Considering all of the interests at stake in the debate over the regional act, the concessions made to fish and

the expected reliability of the above measures and what is the least costly combination?

The Water Budget

The heart of the fish restoration plan is known as the "water budget." The water budget is a volume of water that is used to convey juvenile salmonids from the spawning grounds to the ocean. The dams greatly lengthen the time of the journey and expose the juveniles to greater risks of disease and predation. The water budget also includes the extra water that will be "spilled" as compensation for the spring freshet that the dams eliminated. The "artificial freshet" is spent during April 15 - June 15, which is a critical time in the migration of the juveniles which must make the journey within a month.

The concept of a water budget is not new. Indeed, the entire Columbia River Basin system had been "budgeted," but optimized for hydropower production. The water flows proved to be directly deleterious to the fish and their migration system. The idea of a water budget for fisheries is analogous to the past several decades of electricity planning: How can water flow regulation be devised to increase the success of fish runs?

The raising and lowering of water levels in the dams to enhance fish flows will be out of phase with efforts to produce maximum electricity, putting fish and electricity production in direct conflict. Dams are being filled for subsequent fish flushes at just the time when they ought to be drawing down to maximize subsequent storage. Storage for fish flushes could also be at odds with flood control purposes. The cost of altering water flows can be calculated in terms of water that must be spilled instead of run through turbines.

There was expected disagreement over the size and management of the water budget. Tribal and fisheries management officials sought their optimum level of river flows; electricity managers proposed a sliding scale that would result in downward adjustments commensurate with critical or low water flows. The figure agreed upon in the initial fish plan of 1982 was 550 megawatts (mW) of foregone power.

The impetus for the regional act was fear of impending shortages and concern over financing partially completed nuclear plants. Higher rate schedules at BPA helped to resolve this shortage almost

overnight. Even without completion of the nuclear plants the region moved quickly from feared shortage to real surplus that could last for another decade. This sudden transition meant that the regional council shifted gears almost before it began. The surplus may help to account for the relative ease in completing the initial version of the fish plan. Some observers contend that 550 mW of power capacity would not be traded away so easily in times of shortage. The real test of commitment will come in a low water year.

Restoration of Fish Runs

A series of remedial measures is considered necessary to restore upper river fish runs but these cannot be static, isolated measures. Several aspects of fisheries restoration address reproduction and survival on both upstream and downstream facets of the journey. The particular aspects are more than complementary; they constitute a chain that will break at the weakest link. For example, it does little good to concentrate on hatchery reproduction if the hatchery fish are found to compete with and drive out the natural juveniles or if they are unable to imprint their upriver spawning ground. Neither increased hatchery production nor restoration of natural reproduction habitat will be effective if the juveniles cannot complete the journey to the sea. Likewise, effectively flushing the juveniles to the ocean will be fruitless if ocean harvest practices cannot be controlled. All of the measures are negated unless adequate fish ladders allow adults to return to the spawning grounds.

Neither the value nor the impact of the water budget can be judged merely by the volume that is set aside; more important is the day-to-day management of the water budget. The water flow is monitored by the congressionally established Water Budget Center, which has two water budget managers — one from the tribes and one from the fisheries agencies — who make recommendations to BPA on the release of water. The key to managing the budget is to release the water when the fish are actually moving downstream.

According to the testimony of most fish and wildlife advocates, the sufficient, dynamic condition necessary is management of the river system (by the Corps of Engineers and the associated federal and state agencies) for the co-equal purposes of fish and power production. Decision-makers need to understand the principle of equivalence and be regularly reminded of the status accorded the fish by law. There has been greater interaction among the various river managers including the addition of a new coordinating position for the

Corps, BPA and Bureau of Reclamation since the protection of fish has been emphasized.

Like the power plan, the fish plan is a living document subject to periodic modification. After the fish run target was set in the initial plan, the plan was opened to proposed changes — research, operations, other options — that would achieve the goals more reliably or more cheaply. For example, it might be shown that an increase in hatching fingerlings is more effective than the water budget principle and policy initiatives might be changed accordingly.

The idea of the fish and wildlife program is to achieve “parity” between fish needs and power needs. Parity is a legal requirement, not merely a goal. Defining parity was difficult, let alone creating the most effective program to achieve it. In an operational sense, parity means restoration of the anadromous fish runs. Selection of a restoration level was heavily qualitative because it was difficult to separate fish losses resulting from dam construction from those due to other factors.

Other constraints also affect the restoration. Some aspects of fish losses are deemed irreversible, and absolute restoration is not required. Goals for stocking individual species and goals for regions were established, but restoration was considered to mean the system as a whole. This systemic approach implies a variety of trade-offs between natural and hatchery stocks, between downstream flushes and upstream returns, and among subregions of the basin.

The water budget approach views the several thousand miles of Columbia River as an integrated ecosystem. Prior to dam development, the anadromous fish species traversed hundreds of miles to complete the reproductive cycle. Restoration of these fish runs will require improvements for travel in both directions — from the coastal states upstream and from the headwaters states downstream. The main tool, however, is the fish flush and that process begins with regulation at the upstream reservoirs. The headwaters dams could experience severe fluctuations in order to provide the stream volume necessary for this fish movement.

Resident Fish

Montana is in a unique position with regard to implementation of the fish and wildlife plan. Montana has no anadromous fish runs, so it is only concerned with resident fish. This situation has meant that Montana officials have had a major impact on the design of resident fish restoration programs and new research. From the outset, Montana's concerns have been given favorable attention; Montana received about

25 percent of the fish restoration budget commitment. On the other hand, most observers admit that the salmon are the main concern and tough future decisions about funding programs will favor anadromous fish over resident fish.

The development of dams has had similar, but not identical, impacts upon the resident fish population. Some of the resident fish are migratory — most notably the bull trout and the kokanee salmon. Dams impede their upstream or downstream passage and destroy spawning and rearing habitat. The effects of Hungry Horse, Libby, and Kerr dams are irreversible (unless the dams are taken out) but other problems can be mitigated. The primary concern is the management of reservoirs. The schedule of releases, temperature, volume of stream flows and drawdowns have complex and often unknown impacts on fish survival. Stream flushes are necessary to keep spawning beds clean and to hasten the journey of young fish. Reservoir and lake levels need to be relatively stable in order to allow for reproduction and feeding.

As with the mainstem reservoirs, the headwaters dams have been operated for hydropower and flood control efficiency. Water may be stored throughout the fall to convert into power during the winter or as insurance against a dry year. The pattern of fall storage can be in conflict with the spawning needs of the kokanee. The fish restoration program calls for a minimum fall stream flow, controlled flow fluctuation and restricted reservoir drawdowns to balance these concerns. Considerable research is still in progress and most of the program measures have not been implemented yet, but Montana fish and wildlife officials are generally happy with the standing given to resident fish so far.

Ironically, the needs of resident fish may also be in competition with the needs of anadromous fish. What's good for some fish is not good for all fish. The crux of the debate is in the water budget. There are upstream faucets that theoretically could be used to provide water for downstream flows. They include the upper reaches of the Columbia in Canada, the headwaters of the Snake in Idaho, and the Flathead and the Kootenai in Montana. Of primary concern to Montana is regulation of the Flathead system between the Hungry Horse Dam on the South Fork, Kerr Dam below Flathead Lake and Libby Dam on the Kootenai. Montana has expressed concern that downstream fish flushes could necessitate upstream management that hurts resident fish in the Flathead Basin.

Treating the Columbia River Basin as a single ecosystem could mean that the costs and benefits may not balance for all of the states encompassed by the basin. Upstream states could be asked to make concessions to downstream states when the emphasis is on maintaining stream flows. Montana fish and wildlife officials have been able to modify key aspects of the program and assert the need for additional research on the effects of reservoir management.

THE REGIONAL ECOSYSTEM CONCEPT

The compromise in the Northwest Power Planning Act brings together almost irreconcilable objectives. The primary impetus for the legislation was an expected shortage of electricity and an imperative to find cheap sources for the future. But environmentalists and others concerned with the declining fish runs saw this debate as the last opportunity to reestablish fish management objectives.

The act's creation of the program signalled an important departure from conventional approaches to evaluating environmental costs and benefits. In

requiring "parity" between fish and power, the act balances the burden of proof between power operators and fish managers. Equally important, the act provides a funding mechanism that helps to translate principles into actions immediately. By assessing remedial measures against BPA rates, the fish program avoids the uncertainty and delay over federal funding. Moreover, assigning payment to regional ratepayers instead of national taxpayers is highly consistent with enlightened environmental responsibility: the region of cost is superimposed on the region of benefit.

REGIONAL PRECEDENTS

The Northwest Power Planning Act is primarily regarded as an electricity compact, but it is equally a water compact for management purposes. Congress asked the council to find ways of acquiring the electricity needed in the region at the lowest cost. It also stated that hydropower could no longer be produced without regard for the true costs of dam construction, including the loss of salmon runs and fish and wildlife habitat in general.

The regional council seems to be a true regional or confederated body simultaneously accountable to constituents at both state and federal levels. Unlike some regional organizations composed of federal and state representatives on a joint management team or planning task force (such as the Joint Coal Leasing Program in the West), the regional council is a separate, formal entity jointly constituted by authority of the federal government and the states. History may accord the council a special place in American federal experience for this reason alone.

The regional council's power remains to be tested. BPA can deviate from major aspects of the regional plan only by obtaining an exemption from Congress. On the other hand, the law imposes few regulatory mechanisms on either the BPA or the states. Each Pacific Northwest state has to be persuaded independently that it is in its interest to adopt the plan's features in such areas as retail rates, building codes, and plant site banking.

The states hope to use the council as a counterweight

to the BPA, but this appears unlikely. With completion of the plan, the states are likely to become increasingly concerned that implementation of the plan unduly affects decisions normally made by them. The council's power to plan may be squeezed by BPA from above and by the states from below.

The situations in the Columbia and the Missouri are only partly analogous. Only a few of the general precedents from the Columbia are applicable to the Missouri, but they are important lessons in river basin management that can help citizens and officials make informed choices as issues on the Missouri heat up. Above all, the Northwest Power Planning Council model demonstrates that the issues will not be resolved within a single state, and that bargaining and compromise are preferable to conflict and litigation. The key to success was the creation of a regional authority that allowed federal authority to be tempered by state priorities.

The Columbia River experience has shown that conflicts between upstream and downstream interests, and conflicts between different instream claims, can be managed. If nothing else, the creation of the Northwest Power Planning Council demonstrates that Congress is not reluctant to act in cases where interstate water management issues are in dispute. Unless the states of the Missouri Basin can achieve consensus on their own, they could invite a federally imposed solution.

THE CLARK FORK RIVER BASIN

Over the past two centuries, natural resource development along the Clark Fork River of western Montana has been a microcosm of the history of its host state. Named after Captain William Clark, the river was first traveled by white men during the triumphant return in 1806 of the "Voyage of Discovery," better known as the Lewis and Clark Expedition. The river gained importance as an avenue for the fur traders during the first half of the 19th century; the latter half of the century saw the advent of large cattle ranches in the

broad upper Clark Fork valley and surrounding foothills. The mountains of the lower Clark Fork drainage were experiencing the beginnings of what was to become a major regional timber industry.

In the 1880s, the character of development along the Clark Fork shifted drastically when entrepreneur Marcus Daly began mining "the richest hill on earth." Daly's huge copper mine at Butte and the associated smelter in Anaconda made mining king of the Montana economy, but began a sorry legacy for the Clark Fork

River. By the 1960s, nearly 100 years of uncontrolled pollution of the headwaters had devastated the Clark Fork's ecological balance, leaving a serious question whether the river would ever recover.

The awakening environmental consciousness of citizens in Montana and throughout the nation over the last two decades, however, has had positive effects on the Clark Fork. Water pollution is no longer considered an inevitable or acceptable consequence of industrial development, and the enactment and enforcement of water pollution control laws have greatly improved the quality of human discharges to the river. Residents have become keenly aware of the economic value of clean water in the Clark Fork and are calling upon local, state, federal and private resource managers to help restore

the river.

The complex relationships among water quality and quantity, biota, and human uses are now beginning to be investigated in a systematic manner from the river's headwaters near Butte to its mouth 340 miles downstream in Idaho's Lake Pend Oreille. Forty-seven separate studies of the Clark Fork and its tributaries are planned or underway; many of these studies are being coordinated by the Clark Fork River Basin Project, which was established in 1984 by Montana Governor Ted Schwinden. Researchers are assessing the impacts to the river of mining wastes, sewage effluent, industrial discharges, hydropower projects, and agricultural withdrawals. Ultimately, this information will be used to restore the water quality in the Clark Fork River.

THE GEOGRAPHY OF THE CLARK FORK

The Clark Fork River originates west of Butte at the confluence of Silver Bow and Warm Springs creeks. In its upper reaches, the river follows a meandering, willow-lined course through the center of the Deer Lodge Valley. The Little Blackfoot River and Rock Creek bolster the flow of the upper Clark Fork and as the gradient increases, the streamside willows are joined by large cottonwood trees.

The river doubles in size — and becomes known as the middle Clark Fork — after merging with the Blackfoot River just east of Missoula around mile 100. Ten miles further downstream another major tributary, the Bitterroot River, enters from the south and the average annual river flow now exceeds 5,500 cubic feet per second (cfs). For the next 50 miles, the Clark Fork flows between cobblestone banks in a series of alternating riffles and pools; the course is punctuated halfway by the treacherous rapids of Alberton Gorge.

The confluence of the Clark Fork and the slightly larger Flathead River marks another major change in the river's character. Here at the town of Paradise the glacial Flathead waters combine with the Clark Fork, and the lower river flows smooth and broad. Between its confluence with the Flathead and the Idaho border, the Clark Fork is slowed by three run-of-the-river dams and their associated reservoirs (Thompson Falls, Noxon Rapids, and Cabinet Gorge). The Clark Fork leaves Montana as the state's largest river, with a mean annual flow of 22,000 cfs, which is greater than the combined

flows of the Yellowstone and Missouri rivers at Montana's eastern border. The river flows for only seven miles in Idaho before emptying into Lake Pend Oreille. The lake's outflow, the Pend Oreille River, empties into the Columbia River near the northeastern corner of Washington.

The Upper River

The ecology of the upper Clark Fork River is dominated by the impacts of its tributary, Silver Bow Creek, which for nearly a century received untreated wastes from the huge mining and smelting operations centered in Butte and Anaconda. Along its 25-mile westward course from Butte to Warm Springs, Silver Bow Creek flows through numerous old tailings deposits and the slag piles of abandoned smelters. The creek cuts through the 30-acre Colorado tailings in Butte and the 80-acre Ramsay Flats tailings; the 3,000-acre

Opportunity ponds blanket the benchland west of Silver Bow Creek with millions of cubic yards of powder-fine residue from the ore crushers and concentrators. An abandoned wood preservative plant and the outflow from the Butte sewage treatment plant also add to the pollution load.

As a result of this devastated watershed, the waters of Silver Bow Creek are highly acidic and contain arsenic, cadmium, copper and a variety of other compounds in concentrations toxic to most aquatic life. The magnitude of environmental damage to Silver Bow Creek was recognized by the U.S. Environmental Protection Agency which has included the creek, the Clark Fork River to Deer Lodge, and the associated contamination sources on the federal Superfund list of uncontrolled hazardous waste sites.

The Superfund studies and water quality monitoring program now underway are intended to define the extent of Silver Bow Creek pollution and to develop the information with which cleanup plans can be developed. Researchers hope to complete this study phase by early 1986.

Just prior to its merger with Warm Springs Creek and the start of the Clark Fork, Silver Bow Creek undergoes its first on-line treatment. Here in the 1950s, the Anaconda Company built a series of settling ponds along the stream channel. Only slight improvement in downstream aquatic life was noted until 1972, when the company installed a closed treatment plant in the Butte operations and improved its liming facilities at the Warm Springs ponds. The controlled addition of lime neutralizes the acidic waters and causes the heavy metals to precipitate out of the water and settle on the pond bottom. Water in the Warm Springs ponds is now of high quality, and the ponds support excellent populations of aquatic insects and stocked trout.

The Clark Fork, which starts immediately below the ponds, thus enjoys treated water from Silver Bow Creek and relatively clean water from the second major tributary, Warm Springs Creek. For the first five miles, the Clark Fork hosts an excellent brown trout population, with numbers of "catchable" size fish greater than 1,500 per mile. This fishery is a tribute to the resilience of a stream that was nearly devoid of aquatic life before the treatment system was completed in 1972. As late as 1970, the river periodically "ran red," exhibiting a rust color (caused by iron oxides and other mining wastes) from its source all the way to Missoula, over 100 miles downstream.

But downstream from the source, the Clark Fork's problems again become evident. At Deer Lodge, river mile 20, trout populations are severely reduced (fewer than 300 fish per mile) and they range between 30 and 300 trout per mile at the various sample locations in the next 80 river miles. Below the mouths of tributary streams, fish numbers show a temporary increase; within a mile or so, however, the benefit of the clean tributary water is dissipated and trout numbers again

plummet. Only after the entry of Rock Creek, a stream equal in size to the upper Clark Fork, are reasonable trout populations again evident in the river.

The history of mining pollution of the upper Clark Fork strongly indicates to researchers that toxic pollution is the likely cause of the low fish populations. Chemical analyses confirm this suspicion, showing extremely elevated concentrations of heavy metals in the waters of the upper Clark Fork. Copper appears to be the greatest problem, occurring at concentrations up to 50 times the level the Environmental Protection Agency established as toxic for aquatic organisms. Other potentially toxic compounds at elevated concentrations include cadmium, arsenic and zinc. The concentrations are highest during spring runoff, but remain above EPA toxicity criteria for about eight months in most of the upper Clark Fork. The uppermost section of the river is less seriously affected as concentrations of toxic metals are lower and less persistent there.

In sum, the Clark Fork's initial treated waters sustain a productive fishery, but a few miles downstream the concentrations of mining residues increase to toxic levels and remain elevated until significantly diluted by Rock Creek. This pattern indicates to researchers that a chronic pollution source must be present along the course of the upper river.

Investigations along the river appear to support this theory: the river banks and floodplain are laden with deposits of toxic mining wastes. Many shoreline sites will support no vegetation and some cut banks are marked by bands of blue, oxidized copper. These materials are eroded during high flows and, upon entering the water, apparently provide an annual toxic shock which may kill adult fish and developing embryos. In the uppermost section of the river, the limed water from the Warm Springs ponds helps protect aquatic life and thus the fishery is good. For the next 100 miles to Rock Creek, however, fish populations seem to be devastated by heavy metals.

Research funded by the Clark Fork River Basin Project and the U.S. Geological Survey will attempt to identify the "hot spots" contributing toxic sediments to the river. If these spots can be isolated, erosion control measures or structural modifications along the stream channel might be options to reduce the annual additions of toxic materials to the upper Clark Fork.

The Montana Department of Fish, Wildlife and Parks has also begun research to protect the upper Clark Fork from further degradation caused by excessive water withdrawals. The Montana Water Use Act allows public agencies to reserve water instream to preserve water quality, fish and wildlife. The department is collecting the baseline data to determine the instream flows necessary for these purposes; by 1987 the department is expected to submit a formal application to the Board of Natural Resources and Conservation for maintenance of these instream flows.

The upper Clark Fork drops much of its sediment load behind Milltown Dam, a run-of-the-river hydroelectric facility seven miles east of Missoula. The dam, located immediately below the junction of the Blackfoot and Clark Fork rivers, was completed in 1907. Since that time the bottom of its 400-acre reservoir has been filling up with riverine sediments.

In 1981, Milltown residents became painfully aware of the impacts of mining wastes on the river and the associated floodplain aquifer. Dangerous levels of arsenic were found in domestic wells and residents were forced to haul in water for drinking and cooking. The EPA declared the Milltown site eligible for assistance under the Superfund program in 1982, and intensive studies of the bottom sediments have since confirmed that the arsenic pollution of the groundwater is attributable to the deposition of mining sediments. Concentrations of zinc and copper were also significantly elevated in the reservoir bottom.

Development of an alternative water source for Milltown residents was completed in mid-1985 so residents no longer have to depend on waters influenced by the Clark Fork. Long-term rehabilitation of the floodplain aquifer, however, is a much less certain prospect. During the past 78 years, millions of cubic yards of contaminated sediments have accumulated. Dredging or other removal efforts could resuspend large quantities of sediments, which might then flow over the dam and jeopardize aquatic life downstream. A \$100,000 engineering study will assess various alternatives for cleanup or containment of the Milltown sediment.

The Montana Power Company, the current owner of Milltown Dam, has identified structural defects in need of repair. The company hopes to start reconstruction work in 1986 and complete the work the following year. A high priority of any work at Milltown is to minimize the release of sediments to downstream waters.

Efforts to restore the upper Clark Fork will require intensive coordination among federal, state and local agencies. The Montana Department of Health and Environmental Sciences has the lead role in the Silver Bow Creek and Milltown Dam Superfund sites. EPA has administrative responsibility for investigation and remediation of the Anaconda Smelter Superfund site. The Montana Department of State Lands is involved in permitting the Butte mining operations, and has received federal funds for some reclamation work in the area. Additionally, several local governments and state-federal-citizen advisory groups are active in monitoring and setting policy in the basin. In a system as large, complex and impacted as the Clark Fork, resource managers are keenly aware that any action taken will ultimately have repercussions throughout the drainage. However, most are confident that a well-planned, coordinated program can be developed to provide real direction for recovery of the upper Clark Fork.

The Middle River

The middle Clark Fork is the 100-mile-long, free-flowing section between Milltown Dam and the confluence with the Flathead River. Now a well-used trout fishery and recreational resource, the Clark Fork was long ignored by the residents of western Montana. Missoula, a metropolitan area of 50,000, developed with its back to the river, even though the Clark Fork bisects the town. The occasional red flows that occurred into the early 1970s made most people "write-off" the river; cleanup was only a pipe dream.

In recent years, however, residents of Missoula and other western Montana communities have come to view the Clark Fork as a worthy, albeit neglected and long-abused, resource. The renewed appreciation of the Clark Fork has been manifest by new riverfront parks, increasing recreational use, and demonstrated public concern over water quality. This public concern was most evident in a hotly contested issue involving pulp mill discharges to the river.

In the summer of 1983, Champion International requested that the Montana Department of Health and Environmental Sciences (DHES) issue a modified wastewater treatment permit for its Frenchtown pulp mill. The permit would allow the pulp mill to increase its discharge of suspended solids and release wastewater into the river year-round, rather than just during spring runoff. The modification was necessary because the company's infiltration ponds had clogged from the accumulation of settled particles over the years and had thus lost their filtration capacity.

The brief initial environmental review by DHES concluded that the proposed discharge regime would not adversely affect Clark Fork water quality. Area residents, biologists, and citizen groups complained that more information was needed to determine the potential impacts on Clark Fork water quality, fisheries, and other elements of the aquatic ecosystem. Concerns were raised by citizens along the river's course, and Governor Schwinden received a letter of opposition from the governor of Idaho, whose Lake Pend Oreille receives Clark Fork water.

As a result of the controversy, DHES issued a revised 50-page environmental review and in November 1983 hosted a public hearing in Missoula at which dozens of local citizens presented strong objections to the permit modification. In early 1984, the department issued the

modified wastewater discharge permit but included a number of operational and monitoring stipulations. The department also agreed to prepare an environmental impact statement when the full permit comes up for renewal in 1987, and began a series of studies on the aquatic ecology and water quality of the middle Clark Fork.

For the middle Clark Fork, the water quality monitoring program, fishery assessment, aquatic insect sampling, and other studies initiated in 1984 should help define the types and sources of pollutants impacting the river. Considerable attention is being given to the role of the two largest point source discharges, the pulp mill and the Missoula municipal sewage treatment plant. These facilities discharge large amounts of sediments, nutrients and organic compounds; the interaction of these materials and their effect on dissolved oxygen levels, stream bottom habitat, and aquatic life will be key study elements. Complementary studies of stream bottom algae (periphyton) and heavy metal concentrations are underway, and efforts will be made to determine the impacts of nonpoint pollution sources. Also, because middle Clark Fork trout populations are well below those of comparable Montana rivers, researchers will attempt to learn whether water quality or habitat factors are responsible.

The Lower River

The lower Clark Fork, which begins with the merger of the Flathead River, shows the impacts of three major hydropower developments — Thompson Falls, Noxon Rapids and Cabinet Gorge. As a result of these run-of-the-river dams, over half of its 120-mile length is impounded and the lower river resembles a chain of narrow lakes. Below Cabinet Gorge Dam, the Clark Fork flows freely for its final seven miles before emptying into Lake Pend Oreille.

Studies by the Montana Department of Fish, Wildlife and Parks indicate that the lower Clark Fork fishery is well below historic levels. Native populations of bull trout and cutthroat trout have been drastically reduced because the dams have severed the route for their spawning migration from Lake Pend Oreille to the Clark

Fork and its tributaries.

Efforts to establish populations of gamefish in the reservoirs have been largely unsuccessful, primarily because of the lack of an adequate food base in the reservoirs. The bottoms are covered by fine sediments and are unproductive for aquatic insects. Additionally, the current flowing through the reservoirs apparently inhibits the establishment of stable plankton populations necessary to sustain a productive food chain. Frequent drawdowns of the reservoirs prevent the development of a permanent aquatic plant community near the shorelines, the area normally most productive for aquatic life in lakes. As a result, populations of microscopic animals and small bait fish are limited.

Very little is known about the resident fishery in the lower Clark Fork. Researchers are concerned, however, that the fluctuating releases from Kerr Dam on the Flathead River and the operational regime of the three mainstem Clark Fork dams may be damaging the aquatic food chain and depressing trout populations.

Studies are also underway to determine the role of the dams and associated reservoirs in the cycling of heavy metals and nutrients in the lower Clark Fork. Sediments from the floor of Noxon, Thompson Falls, and Cabinet Gorge reservoirs contain significantly elevated concentrations of copper and zinc; the presence of these compounds is linked to riverine transport of sediments from mining operations in the upper Clark Fork basin. Initial data on heavy metals in the sediments of Lake Pend Oreille indicate that the Clark Fork is still carrying some legacy of mining at its mouth, 340 miles downstream from its contaminated headwaters in Silver Bow Creek. The impacts of the metals on the aquatic ecosystem of the reservoirs or Lake Pend Oreille have yet to be determined.

The role of the Clark Fork reservoirs as “nutrient traps” has also raised water quality concerns. Thick midsummer algae blooms have been documented in some isolated bays in Montana’s Clark Fork reservoirs. In Idaho, residents of the Lake Pend Oreille region have complained of diminished water clarity and increasing algae on the lake bottom, both indicative of increasing nutrient loads. Because the lower Clark Fork hosts no major point sources of wastewater discharge, the nutrients are apparently attributable to the effects of upstream “loading” (from municipalities and industrial facilities) combined with nonpoint pollution (possibly from shoreline septic systems and timber development activities). The state of Idaho and the EPA have initiated water quality studies on Lake Pend Oreille to quantify algal productivity and to determine the role of Clark Fork waters in the nutrient cycle of the lake.

THE CLARK FORK RIVER BASIN PROJECT

The initiation of research projects on the middle and lower river (in response to the pulp mill discharge permit) and on the upper river (as part of hazardous waste cleanup programs) marked an almost unprecedented effort to investigate and resolve water quality problems on a drainage-wide basis. The numerous studies also made clear the need to establish administrative continuity for Clark Fork research, the goal of the Clark Fork River Basin Project. The four-year effort will identify data needs, encourage studies to meet these needs, and insure that the findings will be available from a single source. In addition to studies on the mainstem Clark Fork, the project will also help coordinate agency actions and act as a clearinghouse for information generated by ongoing studies of the major Clark Fork tributaries, including the lower Flathead River, the Bitterroot River, the Blackfoot River, and Rock Creek.

Integral to the concept and potential success of the Clark Fork project is the current "window in time" during which governmental agencies, industry, and universities have the interest and the financial resources to study in concert the problems of the Clark Fork. This opportunity resulted from the coincidence of public and private concerns in the early 1980s that the Clark Fork should and can be restored. To date, funds for Clark Fork studies have been obtained from the Montana Department of Health and Environmental Sciences, the Montana Department of Fish, Wildlife and Parks, special project authorizations by the Montana

Legislature, the Montana University System, the federal Environmental Protection Agency and its Superfund program, the U.S. Geological Survey, Champion International, Anaconda Minerals, and the state of Idaho.

The Clark Fork project includes professional scientific staff, an interagency technical committee composed of government personnel, and a citizens' advisory committee including residents with a firsthand knowledge of the river resource and associated public concerns. A steering committee made up of the directors of Montana's natural resource agencies is responsible for final approval of project plans.

The Clark Fork River Basin Project will provide the informational basis for a comprehensive water quality management plan to maintain and, where necessary, to restore the water quality and aquatic resources of the Clark Fork and its major tributaries from Butte to Lake Pend Oreille. Implementation of the recommendations of the Clark Fork project will be the task of local, state, and federal policymakers. An informed and interested public is the final necessary ingredient if the Clark Fork River is to reach its potential as an economic, ecological, cultural and recreational resource.

The Clark Fork has demonstrated a remarkable capacity to recover from past damage. The attempt to complete the recovery of Montana's most heavily stressed river represents a major environmental challenge to be met over the upcoming decades.

THE FLATHEAD BASIN

Flathead Lake is valued for its scenic beauty. The setting of clear waters, majestic mountains and abundant fish and wildlife has held Montanans and visitors spellbound for centuries. It is no surprise that the Flathead Basin has experienced an influx of development and has felt the accompanying pressures on its natural resources. But economic demands have begun to compromise the Flathead's aesthetic values and ecological resources.

Some problems facing the Flathead Basin are technical: identifying and monitoring the sources of water pollution requires scientific expertise and data collection. Some problems are political: state and local representatives worry about how their constituents will accept water quality controls. Some problems are legal and administrative: a confusing layering of political jurisdictions, conflicting agency standards and ambiguous laws defy an easy remedy to water quality problems. Some problems are economic: who will bear the costs?

Ultimately, the political, legal, administrative, technical and economic concerns must converge if we are to find an equitable solution. And developers of new projects will not simply undertake water quality control efforts without assurance that the costs of the controls have been fairly apportioned and that they will be effective.

The Flathead Basin could become a realization of ecologist Garrett Hardin's "tragedy of the commons," a metaphor in which each herdsman tries to maximize individual gain by grazing additional cows on a common pasture. Each additional lakeshore summer home means a profit for a developer and pleasure for an owner. But the decline in water quality caused by steady, incremental lakeshore development is shared by all basin residents, just as overgrazing threatens the common pasture. The capacity of the basin's water to absorb pollution is finite; use of the basin's water as a "commons" could instead be replaced by a common goal to manage the resource carefully and sustainably.

FLATHEAD WATER QUALITY

History

In the mid 1970s, concern over a prospective coal mining operation at Cabin Creek, on the headwaters of the North Fork of the Flathead across the Canadian border, spurred activists to create the Flathead Coalition. It soon became evident that the international threat of the Cabin Creek mine in British Columbia was not the only problem confronting the Flathead Basin. Management practices at Hungry Horse Dam on the South Fork of the Flathead River and at Kerr Dam below Flathead Lake drew fire. Subdivisions and other lakeshore developments seemed to be multiplying rapidly. Logging and mining were increasing. Fish populations dropped and the water clarity declined noticeably. Basin residents began to realize the complexities of the problem confronting them.

Congress responded in 1978 by funding an EPA-sponsored Flathead River Basin Environmental Impact Study (FRBEIS) to review all activities affecting the basin, including population growth, economic developments, government structures, climate, recreational use and fish and wildlife populations. FRBEIS focused on the interrelationships among these activities as being crucial to water quality management.

The FRBEIS inventoried the basin's natural resources. The information gathered was to serve as a baseline of resource conditions against which future changes could be measured. The study also identified the environmental conditions needed to maintain the region's human and natural values.

As a result of the FRBEIS efforts, the 1983 Montana Legislature established the Flathead Basin Commission as a permanent government entity to remedy the issues confronting the Flathead. The Flathead Basin Commission was directed to encourage cooperation and coordination among the various land management jurisdictions throughout the basin. These agencies regulate activities that cross an international border, various state, federal and private lands, two county lines, and the boundary of the Flathead Indian Reservation. The area is the site of proposed coal mines,

oil and gas leases, timber sales, recreational subdivisions and urban expansion.

These development pressures and the tangled jurisdictional network present both challenges and opportunities for the Flathead Basin. The creation of the Flathead Basin Commission permits a regional approach to solutions for the basin's unique problems. The regional approach also provides the opportunity to develop a management plan with a broad base of support, which can serve as an important model for other Montana regions.

Technical and

Administrative Problems

Eutrophication is the aging process by which all lakes fill in from clear, non-productive bodies (oligotrophic), to algae-laden lakes, to very shallow and marshy bogs, and eventually to meadows. The eutrophication of a lake can be greatly accelerated by human activity when too much of certain nutrients (naturally present but in limited quantities) are added into a water body.

In Flathead Lake and most of the lakes in the Flathead drainage, the limiting nutrient is phosphorus. Excess phosphorus can encourage algal blooms, hastening the lake's evolution into marshland. Phosphorus can be carried on sediment particles eroded from forests, agricultural areas or urban lands. It may be introduced from dairies, septic tanks, fertilizer and sewage treatment plants. Phosphorus can also come from natural sources such as the decaying bodies of spawned-out salmon.

But the bulk of the phosphorus load comes with the sediment in the spring runoff from the streams that feed the lake. The exact relationship between sediment and phosphorus is not fully understood, but it is clear that increased sediment loads accelerate the aging of valley lakes and cause premature death.

Activities around the shore of Flathead Lake and along upstream drainages are accelerating Flathead Lake's eutrophication. This degradation has been documented by a number of studies that suggest both

point and nonpoint source pollution contribute significantly to the problem. Controversy continues over the nature and extent of each of these types of pollution.

In general, point sources of water pollution can be more easily remedied than nonpoint sources, although the technical solutions can be extremely costly. Point source problems usually occur within a single political jurisdiction, such as factories or sewage treatment plants in a municipality. Once identified, authority to limit them can be readily established. The federal Clean Water Act provides specific standards for point source water quality, and enforcement can be carried out with a minimum of political and jurisdictional problems. Otherwise prohibitive costs can be offset by a federal program providing a large percentage of the funds for treatment facilities. Advanced wastewater treatment plants (AWTs) are either already in place or will soon be installed in the communities on Flathead Lake, yet nutrient loading still occurs.

Nonpoint sources of water pollution are the result of a variety of land uses; consequently, various land use management practices must be used to control them. Many efforts have been made, but in a fragmented, disjointed fashion. The basin's land management agencies including the Forest Service, the Conservation Districts, the Soil Conservation Service, the county planning boards, the departments of Highways, State Lands, Fish, Wildlife and Parks, and Health and Environmental Sciences, and the Confederated Tribes, have adopted water quality management practices. However, little formal or systematic coordination takes place among these agencies. The lack of reliable data underscores the need for more inter-agency cooperation to determine the extent of nonpoint source water pollution.

will pay only a small fraction of the cost of an upgraded water treatment plant; the federal EPA picks up the lion's share. The Montana Water Quality Bureau, which determines the need for upgrading municipal treatment plants, receives federal funding. None of the Bureau's money comes from the state's general fund. This dependence on federal funds provides some insight into the emphasis on municipal wastewater treatment plants. Municipal wastewater treatment is most often a starting point for solving water quality problems because:

- 1) the point source is easily identified;
- 2) the technology exists for curtailing the problem;
- 3) the political jurisdiction is site-specific;
- 4) the enforcing agency receives federal funding; and
- 5) the brunt of the costs is not borne directly by the local citizenry.

Solutions do not come as easily for nonpoint sources which are not as easily identified or regulated. A lot of owner may resent restrictions on lakeshore building or real estate speculation. The costs of building an adequate individual septic system may be prohibitive. Water quality protection would increase costs for hydropower developers, logging interests, subdividers, oil and gas lessees, farmers and ranchers, and many others. Who should be forced to pay the costs of land use regulations designed to benefit the whole community? Why should long-time residents have to shoulder costs created by new land developers whose incremental projects are exacerbating the water quality problem? How can these costs be equitably distributed? To what extent is the inability to distribute costs part of the problem?

Legal Problems

Although the economic questions are not easily answered, a legal framework exists for a coordinated, regional approach to water quality management in the Flathead Basin. Appropriate laws, including the federal Clean Water Act and the Montana Water Quality Act provide the necessary authority. But the laws do not always include a mechanism for implementation. The challenge is not simply to provide a legal basis for action but to provide social and economic incentives within the laws.

Effective solutions to the distribution of costs incurred by environmental regulation depend on citizen involvement throughout the planning process. Guided by an innovative, regional, legal framework, a coordinated approach to water quality management options could lead to an equitable apportionment of costs in the Flathead Basin.

Economic Problems

The septic system of a single lakeshore home will not cause the lake's demise. One more clear-cut or new logging road on national forest land will not by itself contribute significantly to the basin's nutrient input. The "commons" analogy is appropriate: no individual feels that one additional cow grazing on the pasture will ruin the pasture, but when each herdsman adds one more animal, the pasture is indeed ruined.

The commons dilemma illustrates a basic problem confronting Flathead Basin residents concerning water quality: who pays the costs? Federal funds pay for the monitoring and construction of advanced wastewater treatment plants. The citizens of Kalispell, for instance,

REGIONAL CASE STUDIES

Regional basin water quality problems are not unique to Flathead Lake. Other drainages have struggled to maintain high standards of water quality, using different approaches with varying results. Case studies of Lake Tahoe (California) and Dillon Reservoir (Colorado) show situations similar to the Flathead. The nature and sources of the nutrient loads to these lakes differ somewhat from the Flathead, but their approaches to the problem are relevant.

Lake Tahoe

Lake Tahoe is the centerpiece of the Sierras, famous for its crystal clear blue water, steep granite slopes and pine forests. The lake, half in California and half in Nevada, faces pressures from population growth and development associated with gambling. Although it is not as large as Flathead, the pressures of visitation and development have been even greater. Authorities in the area have struggled to protect its scenic values.

Technical Issues

Recognizing a threat to Tahoe Basin water quality, the EPA funded a 208 Water Project Study of Lake Tahoe in 1976. The study identified nutrient sources and limits and recommended a monitoring program. A water quality summary was developed, and the authority of relevant agencies delineated.

The study indicated that nutrients from sewage and erosion posed the biggest problems, with land-use trends directly tied to algal growth. Surface runoff was identified as the dominant source of a nutrient load estimated to be from 5 to 16 times greater than would be found under natural conditions. Algal growth would have to be prevented to maintain the clear, oligotrophic characteristics of Lake Tahoe. This would mean reducing the principal nutrient loads to the lake, nitrogen and phosphorus.

Sewage has been exported from the basin since 1969, but nutrient loading to the lake is still increasing rapidly. Point source nutrients represent only 15-25 percent of the total load. Precipitation, runoff and natural sedimentation contribute well over 50 percent of the total nutrients. But approximately 25 percent of the

nutrient yield comes from such man-induced, nonpoint sources as impervious surfaces including roads, pavement, parking lots, houses and other non-vegetated areas.

Administrative Issues

Several attempts were made to establish regional authority over the basin's water quality problems. The first of these, the Tahoe Regional Planning Authority (TRPA), developed proposals to control identified water quality problems in the basin; however, it did not require strict adherence to the plan. The TRPA identified four key areas of concern: 1) erosion and urban runoff control projects; 2) on-site surface runoff control projects; 3) prevention of pollution from new development; and 4) improvement of forest management practices. The TRPA sought to prohibit, or at least curtail, any new subdivision and to limit the use of impervious surfaces on individual land parcels. It also proposed halting construction in riparian zones and stopping all basin development unless projects were implemented to offset erosion and control urban runoff. The TRPA depended on voluntary compliance from a wide range of interests: the states of California and Nevada, gambling interests, land speculators, tourists, environmentalists and others.

The TRPA, however, disapproved of only five percent of the development proposals it reviewed, and it became apparent that a more effective authority was needed. Disputes between Nevada and California created a split over the basin's management. No longer willing to cooperate, both states went in separate directions—California forming the California Tahoe Regional Planning Authority and Nevada falling back on existing jurisdictions.

The TRPA did accomplish some important tasks. It organized the Tahoe Basin Association of Governments, which had the power to enforce existing land-use controls and to provide such public services as erosion control projects. Through monitoring and associated studies, the TRPA found that the impact of land development depends on the carrying capacity of a given area. The TRPA used this information to develop a land capability classification system dividing Lake Tahoe Basin lands into three categories: high, moderate and low erosion hazard. The respective carrying capacities of each category would determine the nature and extent of development permitted.

The TRPA was not able to coordinate Tahoe Basin development with the land capability classes. If development continues at its current pace, suspended sediments will increase by 27 times the natural rate. Attempts to coordinate voluntary management practices in the Tahoe Basin have met with little success. But even without regulatory authority, the TRPA and its successor, the California TRPA, laid much of the foundation for management options for Lake Tahoe.

Legal Issues

In 1978, the California Lahontan Regional Board, the Tahoe Basin division of California's Water Resources Board, was given authority to develop a water quality management plan for the Tahoe Basin. The plan's implementation relied on a memorandum of understanding among the relevant land-use managers. These entities formed a Mitigation Task Force which sought to obtain federal grants for sewage plants and to develop an environmental impact fee structure. The main purpose of the fee structure was to purchase lots unsuitable for development. A development priority system of transferable development rights would then provide compensation to owners of lots in areas unsuitable for development.

The draft plan was distributed for adoption to the various agencies with program authority, including the departments of Highways and Fish and Wildlife, along with county planning boards. A 20-year schedule of compliance was adopted, and several state agencies took the initiative and started soil erosion control projects and on-site surface runoff controls. The Lahontan Regional Board's CTRPA plan adopted other measures. It recommended changing zoning ordinances to prohibit development in excess of land capability in stream environment zones. It proposed re-zoning unsubdivided lands zoned for urban use as general forest land to prevent new subdivisions. The federal Clean Water Act requires the U.S. Forest Service to comply with all state, interstate and local water pollution control laws, and the CTRPA has taken advantage of this provision by adopting several ordinances to control forestry practices.

Economic Issues

Another interesting provision of the Lahontan plan outlines an "offset" policy. The offset provision prevents new development unless accompanied by offsetting remedial erosion control projects. Offset schedules must be adopted, phasing in new development as erosion and urban runoff control projects are built. A permit quota system based on the carrying capacity of the basin was developed, and performance bonds are required to assure compliance and enforcement.

Voluntary offset fees, similar to performance bonds, give a developer the option of paying a fee and subsequently being reimbursed by local government, or waiting until local government makes the necessary commitments for development to go forward.

The Lahontan's offset fee formula is intended to accomplish several tasks. It determines the total cost of erosion and urban runoff control projects and the anticipated local share of these costs, considering the availability of state and federal grants. It also ensures fairness to all lakeshore development projects, past and present, by charging developers for erosion control and by taking into account the extent of the increased erosion at each site.

The transferable development rights concept, incorporated with a land acquisition and offset policy, allows for growth at an acceptable, controlled pace, compensating landowners who will not be allowed to develop. According to the Lahontan Plan,

"The prohibitions do not directly prohibit construction of new subdivisions, development of environmentally sensitive lands, or development which is not offset by remedial erosion control measures. Rather the discharge of sediment and nutrients which results from such development is prohibited."

Dillon Reservoir

Dillon Reservoir, Colorado, provides another example of an area high in scenic value threatened by the pressures of development. Located high in the Rockies 40 miles west of Denver, the five-mile-long, two-mile-wide reservoir supplies 40 percent of Denver's drinking water. Eighty-four thousand skiers visit the area in the winter, and summer visitors flock to the lake to fish for kokanee salmon and trout.

Built in 1963, the Dillon Reservoir drains elevations from 13,000 to 8,500 feet and enjoys oligotrophic status. The reservoir's crystal clear water results from granitic soils low in nutrients; the consequent beauty has attracted a proliferation of lakeside dwellers. But this development has had its effect. Recent summers have witnessed fish kills, increasing algal blooms, offensive odors, and a loss of water transparency.

Technical Issues

Area residents recognized the threat to their lake and began to organize. To most of the basin's inhabitants it was apparent that the degradation of the lake's water

quality would mean higher water treatment costs for the city of Denver, lower property values for lakeside residents, and a loss of aesthetic appeal for watershed residents and tourists. A study was initiated to pinpoint the problems and suggest remedial measures to maintain the lake's oligotrophic status.

The six municipalities in the Dillon Basin already had built or were building advanced wastewater treatment systems (AWT's). But research indicated that the AWT's were dealing with only 25 percent of the nutrient load, and at maximum efficiency they were eliminating only 85 percent of that portion. The Dillon study, as in the Tahoe case, found that 75 percent of the phosphorus and nitrogen loads originated from nonpoint sources, both natural and man-induced.

Administrative Issues

Because the water quality problem transcended jurisdictional boundaries, area citizens adopted a coordinated regional approach. A Summit Water Quality Committee convened to develop a plan. The committee understood that any plan's success would hinge on how it addressed economic growth. Prohibitions on development or costly conditions to growth would be too controversial, so the committee developed objectives that would satisfy all parties. The objectives were:

- 1) to maintain existing uses;
- 2) to keep the lake from being excessively degraded;
- 3) to use state-of-the-art nonpoint source controls;
- 4) to use state-of-the-art point source controls; and
- 5) to allow point source discharges of phosphorus in the basin to expand as existing nonpoint sources are reduced.

The fifth objective provided the crucial impetus for plan acceptance: the "trade bubble" concept which has been used extensively for air pollution control. Point source controls, such as AWT's, have been required for several years; however, further reduction of phosphorus loads from point sources will be increasingly expensive and technologically complex. Nonpoint source control methods such as detention ponds and infiltration pits are far less costly. The trade bubble gives counties, developers and municipalities an incentive to install nonpoint source controls, and still allow growth.

Phosphorus has been identified as the principle nutrient contributing to eutrophication in Dillon Reservoir. A limit on total phosphorus levels for the lake was determined. Basin development can expand at any rate provided that phosphorus limit is not exceeded. For example, city commissioners might review a subdivision proposal and find that it would increase phosphorus levels beyond the capability of their city's AWT. They could approve the subdivision only if phosphorus loads were reduced elsewhere through nonpoint source controls. For instance, the state

highway department could channel the nearby interstate highway's surface runoff into detention ponds where sediments containing phosphorus would settle out. The amount of phosphorus removed would be monitored so that the goal of limiting the total load to the lake could be achieved.

The trade bubble idea circumvents changes in existing land-use regulations; this could be why the concept has been embraced by land-use agencies, citizens and developers alike. If phosphorus reductions are realized, the land managers might be encouraged to take further actions to improve Dillon Reservoir's water quality.

Legal Issues

The inclusion of a citizen committee in the Dillon water quality plan process and the trade bubble concept guarantee citizen involvement in controlling lake pollution. The Summit Water Quality Committee developed an "Intergovernmental Agreement for Summit County Water Quality" and distributed it to all relevant parties for approval: ski areas, the U.S. Forest Service, the principal mine in the area, the Colorado Water Quality Bureau, and the citizen committee members. All parties agreed to participate in a coordinated approach to protect water quality in the area.

The agreement created a Phosphorus Policy Committee to coordinate point and nonpoint source control activities. The state Water Quality Control Board already had point source authority, and local governments were allowed to develop their own nonpoint source controls. Each government entity was allowed to discharge a specified amount of phosphorus per year. But for every two pounds of that amount controlled, one pound of credit would be granted. For example, if the city of Frisco's AWT reached its treatment capacity, the city could construct infiltration pits to collect and treat parking lot, roof and sidewalk runoff, and permit growth that otherwise would have been unacceptable. This policy would encourage cheaper nonpoint source controls.

Economic Issues

Mechanisms for the control of water quality in the lake were both political and technical; the proper mix of these had to be determined to get the best results. Through the technical expertise of the phosphorus policy committee, proposed developments were ranked according to their cost effectiveness. The Water Quality Board of the Colorado Department of Health and the implementing agency (highway department, municipality, sewer district, ski area, or other) would sign an agreement before a project could begin.

Upon entering agreement with the Summit County

Board, the implementing agencies were expected to adopt land use, zoning, subdivision and building code controls that closely adhered to the board's goal of not exceeding a specified annual nutrient load to the reservoir. If they failed, these agencies would be found in default and could no longer participate in the trade bubble incentive program.

The Dillon Reservoir case also demonstrates a unique method for funding water quality protection. Each Summit Water Quality Committee member's contribution to funding for monitoring and phosphorus removal is based upon the proportion of its wastewater flow into the lake. This allocation is possible because the total nutrient load limit of the lake has been identified.

The agreement succeeded because it recognized the need for citizen involvement and included incentives for participation and back-up enforcement authority. The text of the agreement does not grant the Summit Board regulatory authority. However, the board can exclude those participants who do not conform to its policies. Summit County's public had been actively included in every stage of planning; therefore, all the appropriate governing bodies consented to enter this agreement. All parties agreed that water quality improvement is worthwhile, and that is the agreement's strength. The exclusion of a defaulting member will prove effective only if participation of other members remains at full strength.

FLATHEAD WATER QUALITY MANAGEMENT PLAN

Legal and

Administrative Solutions

The problem facing the Flathead basin is complex. The mix of federal and state law, local, federal and state soil erosion and sediment control regulations, agricultural practices, subdivision rules, agency rules, recommended best management practices, and generally accepted behavior concerning water quality presents a confusing array of directives.

The objective of the federal Clean Water Act — to make all streams fishable and swimmable by 1983 — provided no guide for funneling all the various agencies' authority. The disjointed and disparate laws and regulations need to be reassessed, and this should be done with ample opportunity for citizen input. The Flathead 208 Project concluded that:

"So far-reaching are its implications that a (water quality) planning program properly executed may very well shift the focus of a community's comprehensive planning away from the traditional planning department. Questions of economic growth and land use must certainly be brought into focus before water quality planning can be brought to a meaningful conclusion. These, in turn, may involve a complete re-examination of

a community's growth policy as a whole. It will certainly challenge some traditional concepts of agricultural, silvicultural, mining and construction practices and management. Successful water quality management will not happen automatically and, in the final analysis, will depend upon both citizen activists and those who are not necessarily environmentally oriented, to make certain that the areawide plans are both meaningful and implementable!"

A master water quality maintenance plan must provide incentives to all participants to guarantee cooperation. Without economic or social incentives, private interests likely will resist restrictions on economic growth. The challenge, therefore, lies with the agreement of these interests in developing a plan. Compliance with regulations almost always means added expense, and unless those asked to comply can see the economic benefits of improved water quality, adherence is unlikely.

Interagency agreements among local and state agencies involved in water quality management could eliminate reliance on voluntary compliance for best management practices. Except as noted previously, legislation already requires improvement and maintenance of water quality by the individual agencies. There are several possibilities for an interagency agreement:

1) Under a formal agreement, each agency would work toward implementation of the management plan in its own area of statutory authority. Enforcement would be

administered by each agency according to its mandate.

- 2) An interagency agreement could establish a joint administrative board with enforcement authority over those agencies that do not exercise their authority.
- 3) The Flathead Basin Commission could be designated the regional management authority.

This third solution would be within the requirements of the federal Water Pollution Control Act and would be similar to Summit County's Dillon Reservoir Phosphorus Committee. The Phosphorus Committee has the authority to require participation by the state and local authorities in a formal, legally binding intergovernmental agreement that protects water quality.

Economic Solutions

Economic strategies for water quality protection may include offset policies, trade bubbles, land acquisition, planning and zoning. The offset policies and trade bubbles mechanism discussed in the Tahoe and Dillon case studies might be applied to the Flathead Basin. Both plans are intended to allow development to occur without further degrading the area's water quality.

Public ownership of critical watershed areas allows for complete control of land use activities and protection of water quality values. In certain areas, public acquisition may be the only way to prevent contaminating activities. The priority for determining which areas require protection are determined through ecological and hydrological values. Land acquired for preservation would be under a public agency's supervision, and could emphasize preservation in management.

Following the designation of priority parcels for acquisition, potential funding sources must be identified. Federal, state and local governments can purchase watershed lands independently or jointly. The private sector can contribute through foundation grants, land bequests to public jurisdictions or acquisition by private conservation organizations. The public can also initiate bond issues for acquisition of specific parcels or for establishment of a watershed preservation fund. Finally, a water surcharge imposed by water suppliers could fund acquisition of priority watershed lands to benefit water consumers.

Because there are financial limitations to any acquisition program as a watershed preservation strategy, land-use regulation must play a pivotal role in watershed management planning. Land-use controls can be used to direct growth away from critical areas and to control discharges in developed areas as well.

Planning and zoning can facilitate many land-use management strategies. Updating master plans to

include watershed protection plans, identifying critical watershed areas; changing zoning ordinances to reflect downzoning in designated growth areas and upzoning in preservation areas; and mandatory clustering laws (concentrating subdivisions in clusters in exchange for a lower density on environmentally sensitive lands) are possible alternatives.

Conservation easements also may be used to provide scenic natural areas and watershed protection without land purchase. These legal agreements between landowners and the organization receiving the easement can provide significant tax benefits to the landowner. Because conservation easements are voluntary they might lead to piecemeal effects and make it difficult to implement land-use plans. Still, they are easily available as a water quality management option.

Economic incentives and disincentives can include investment and tax incentives for infrastructure work such as roads or sewers. Public funds could be invested to discourage private development in areas that need protection while promoting development in designated growth centers. Public funds for major projects could be contingent upon compliance with area watershed protection plans. Tax incentives could encourage maintenance of large land holdings to minimize the effects of haphazard subdivisions. Tax dollars applied toward watershed and open space acquisition management programs also would help.

Transferable development rights (TDR) represent another method to preserve open space and watersheds while channelling growth into designated areas. The purchaser of these development rights can use them to increase density in a development in a designated growth area at an increased density. TDR programs can be promoted through existing county planning offices or through a public land credit exchange institution. The program would identify sensitive watershed areas for protection and growth areas for development. Property owners in areas requiring protection would be provided credits, representing lost development value, which could be sold to a developer in a growth area who could then build to higher densities than would otherwise be allowed.

This system will work only if a single planning or land-use agency has the authority to limit or expand development in designated protection and growth areas. Some regions have included TDR's as part of their comprehensive management plan and have funded "exchange boards" to promote the sale of development credits without necessitating public purchase. For development rights to be marketable, however, development pressure must be high and land available for development must be in short supply. While this situation is present to some degree in the Flathead, it remains to be determined if the pressures are great enough to warrant establishing a system for TDR's.

Public Participation

The first attempt to develop a water quality plan for the Flathead Basin was the EPA-funded 208 project. Although this project compiled a lot of data, identified pertinent agencies and established multi-agency authority, there was no incentive for continued activity after its funding expired. More important, citizen involvement was not recruited at crucial stages in the planning process, limiting the incentive for the public to accept a managed economic growth plan. The 208 project revealed some important lessons about the utility of public participation. The project found:

"One feature that seemed to be characteristic of the planning process (especially at the local level) was the desire to avoid controversy. The solution of choice was usually to plan to build improved sewage treatment facilities rather than grappling with the larger pollution problem which might require a more complicated solution (land-use plans, etc.). In addition, although public involvement was mandated, environmental and consumer interest groups were usually under-represented. Public involvement often took the form of public education rather than public input."

Concentrating on technical solutions to pollution problems, the Water Quality Bureau and the EPA seldom built local support until the plan neared completion. The 208 water quality management strategy was unsuccessful, perhaps largely because it did not include local citizens as partners early in the planning. This was particularly evident in the exclusion of county governments. Although agricultural organizations, local environmental groups and state agencies were generally well represented, county government was given only cursory attention. Project coordinators recognized their mistake too late:

"This is a significant institutional factor, because the regional agencies had no real enforcement powers, and any implementation of a water quality management plan would almost certainly involve county government as well as the state government."

The 208 legacy provides an important lesson: "While there is a need to develop technical knowledge of water quality, there is also a need to develop a constituency to support such monitoring activity and to support action for alleviating problems." Including provisions for effective public participation will not guarantee a plan's success. But this necessary condition must be met for a water quality management strategy to succeed.

CONCLUSION

None of the tools discussed above is new. These concepts have been introduced in parts of the United States with varying degrees of success. But no single element will solve all the water quality problems of such a large, diversified basin as the Flathead. To succeed, a basin management plan must explore the feasibility of all the options. Technical solutions must be backed by popular support. And policies must be reinforced with incentives for voluntary compliance and regulatory authority.

Flathead Basin residents must have ample opportunities for involvement. The choice and proper mix of solutions for technical, administrative, legal and economic problems cannot be developed without citizen participation.

A successful water quality management plan in the Flathead Basin is possible. How well it is accomplished will depend on how well the Flathead Basin Commission blends management options, and defines and apportions the costs for protecting Flathead's water quality.

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MONTANA WATER POLICY AND MANAGEMENT

INTRODUCTION TO STATEWIDE ISSUES

Many of the issues involved in Montana's water policy are statewide, rather than basinwide, concerns. This section of the report involves these issues.

Groundwater, for example, is primarily a water quality concern, and threats to groundwater quality can be found in both eastern and western Montana.

Hydroelectric issues and the absence of a comprehensive state hydropower siting plan also affect the entire state. Matters concerning neighboring Canadian provinces and Montana are present in the Columbia River, Missouri River and Hudson Bay drainages as well.

And the question of the public trust doctrine's

application in Montana has important ramifications across the state. The 1984 Montana Supreme Court confirmation of the public's right to recreate on waterways in Montana is just one example of the possible implications of the public trust doctrine.

This section also summarizes some of the important state water policy activities, including those by the Department of Natural Resources and Conservation, the Department of Health and Environmental Sciences, the water courts, the Reserved Water Rights Compact Commission, and the Montana Water Resources Research Center.

SMALL-SCALE HYDRO DEVELOPMENT IN MONTANA

In the early 1980s, developers filed more than 100 applications to construct small-scale hydropower projects on Montana streams and rivers. The flurry of activity here and in other western states was described as a "gold rush in falling water," and presented a sharp contrast to the indifference toward small-scale hydro development that marked preceding years.

Much of the interest in hydropower stemmed from recently enacted federal laws and complementary state statutes that provide significant financial incentives to hydropower developers. In light of an apparent energy shortage, lawmakers promoted small-scale hydro as

clean, renewable energy that could help reduce reliance on imported energy sources. Small-scale hydro was also believed to have few environmental drawbacks, in contrast to conventional fossil-fuel or nuclear power plants.

Since the initial boom, however, the small hydro industry has been subject to re-evaluation on a number of fronts. Developers have been discouraged by complex regulatory processes; resource managers have raised environmental concerns; and energy analysts have questioned the value of promoting new energy sources in a period of regional power surplus. As a result, the

industry has been unable to move from paperwork to on-the-ground development, and only a handful of projects have been constructed. A review of the status of small hydro in Montana and the related environmental and economic policy considerations can shed some light on the industry's future.

What is Small-Scale Hydro?

The term "small-scale hydro" has been used to describe projects ranging from simple waterwheel generators on tiny creeks to huge dams on streams or rivers. This wide variation is a result of federal regulations that base licensing procedures and financial incentives on power generation capacity. Some federal regulations impose a five megawatt (mW) maximum for small-scale classification, and this is probably the most widely accepted number. Other statutes use 15 mW and 30 mW as the small-scale limit. The federal 1978 Public Utilities Regulatory Policies Act (PURPA), the most important law promoting alternative energy development, allows facilities of up to 80 mW to qualify for small power producer benefits.

This variety of definitions means that "small-scale" hydro projects are not necessarily small. A five mW project typically requires a dam higher than 50 feet; one proposed project in Wyoming calls for a 190-foot-high dam, which would have an average output of about 60 mW and a maximum rating of 144 mW. At the other end of the spectrum are the so called "microhydro" projects that generate 100 kilowatts (kW, 0.1 mW) or less.

Classification of hydroelectric projects by "head" (the vertical distance water falls between a dam or diversion and a powerhouse) and flow (the volume of water passing through the turbines) more clearly defines the scale of development. High-head, high-flow projects are major dams, such as those developed throughout the Columbia River system; low-head (less than about 60 feet), low-flow projects are typically microhydro projects designed to meet the energy load of an individual home, ranch or shop.

Most of the projects currently proposed in Montana and other western states, however, have been designed for the high-head, low-flow conditions of small mountain streams. These projects typically use a diversion dam to channel streamflow into a penstock, the long pipe that conveys water to the turbine. The

penstock often extends several thousand feet downslope to obtain the greatest head and thus the maximum power output. Water under tremendous pressure exits from the penstock at the powerhouse and drives a turbine connected to a generator. The generator produces electricity, which enters transmission lines.

Low-head, high-flow projects are characteristic of valley locations, where rivers provide large quantities of water but where gentle topography precludes designs incorporating a sizable vertical drop. Most of the newly proposed low-head, high-flow projects would use existing dams having large reservoirs and the capability to regulate flow releases. When hydroelectric generators are added to these dams — termed "retrofitting" — they can often produce significant amounts of power without environmental disruption. Low-head projects can also be designed for use on municipal water supply systems, irrigation canals, or other water developments.

The emphasis on retrofits and small stream developments results from a number of factors. First, most of the economically attractive sites for major dams have been developed already. In addition, small projects and retrofits can be developed without the tremendous capital investment required for major dams. Finally, public concern for environmental values can represent a serious obstacle to the development of large dam and reservoir projects.

Environmental Impacts

Although the hydro revival was initially hailed as an environmentally sound alternative to nuclear and coal-fired power plants, some resource managers have had second thoughts. They have concluded that many of the small-scale hydro projects proposed on Montana streams would severely damage aquatic resources.

Diversion of water from the natural stream channel into the penstock is the greatest concern of fisheries biologists. Such diversions can decrease flows in a mile or more of a stream channel to levels below those needed to support healthy populations of fish and aquatic insects. Dewatering can also eliminate crucial spawning areas. The diversion structures used with high-head projects present a barrier to fish movements, a key concern because the trout populations of many lakes and rivers depend on adult fish migrating upstream to spawn in small tributaries and on juvenile fish moving downstream to restock the larger waters. Diversion

structures can also jeopardize water quality by acting as sediment traps that must be flushed periodically.

Fisheries biologists are also concerned about the cumulative impacts of many small-scale hydro developments in a single drainage. In a study in the Swan drainage, biologists are assessing how development of 20 proposed small-scale hydro projects would affect the migration of trophy bull trout. Preliminary analysis indicates that development of many small-scale hydro sites, along with the increased sedimentation from an anticipated timber harvest, could significantly reduce bull trout populations in the Swan Lake-Swan River complex.

Another consideration is the effect of hydropower developments on Montana's already complicated water rights situation. Hydropower generation is a beneficial water use under Montana law, and potential developers must apply to the Department of Natural Resources and Conservation to reserve the water required for their project. The developer of a potential hydro site is likely to apply for most or all of the available water in order to maximize power generation.

At retrofits on existing dams, issuance of a water right permit to use the entire flow release for hydroelectric generation may have a significant effect on future consumptive uses upstream. Agricultural operations upstream from the dam could be precluded from expanding irrigation because new water withdrawals would reduce the water reaching the generators and infringe on the hydropower water right. DNRC officials cite Noxon Dam on the lower Clark Fork River as an instance where established water rights for hydropower may have "closed down a basin" by effectively stopping any additional consumptive water developments upstream.

Retrofits can also interfere with downstream water rights if flow releases are regulated for power production rather than to meet established agricultural and municipal needs.

Instream flow is the primary water right concern with respect to the high-head diversions in mountainous areas. Before the required federal license can be issued for a project, state biologists recommend the amount of water that must remain instream, rather than being diverted into the penstock. This bypass flow must remain inviolate to protect fisheries; however, there is no tested legal mechanism for guarding this flow against future consumptive withdrawals.

Regulation of Small Hydro

Under the Federal Power Act, the Federal Energy Regulatory Commission (FERC) has licensing authority for virtually all nonfederal hydropower projects in the United States. Montana and other states have felt an increasing frustration with the lack of state control over small hydro because such developments have so many policy implications for state natural resource management. To date, FERC has shown little consideration for state concerns over water rights, and the federal agency's track record on environmental concerns has often been criticized. Additionally, FERC issues permits and licenses without regard to any overall siting plan.

Many officials in Montana and other states have questioned whether small-scale hydro is a legitimate federal interest, and some interstate governmental organizations are supporting congressional initiatives to transfer control of small-scale hydro from FERC to the states. Maine has attempted to take the initiative from FERC by developing a state hydropower plan, which identifies where hydro projects can and cannot be sited. Oregon regulates siting as part of an overall state licensing program for small-scale hydro.

The effect of such state legislation may be more advisory than binding on FERC, as courts have upheld the doctrine of federal preemption for hydropower licensing. Nevertheless, a state program to identify which potential hydro sites are suitable for development, and which should not be developed due to environmental constraints, could have an important influence on the federal agency.

Federal legislation may also provide a promising approach for more state control over hydro development. Minnesota Senator David Durenburger's proposed State and Local Rivers Conservation Act would allow states to designate river systems for special management and would offer federal funds for river conservation programs. Hydropower projects could not be developed on state-designated rivers without state approval.

A separate bill by Maine Senator George Mitchell would allow states to prepare a comprehensive plan detailing which waterways should be available for hydropower development and which should be protected

by virtue of other resource values. FERC would have to approve such plans.

Funding for environmental review of major hydro projects raises an additional point of contention in state-federal relations. Because hydro projects come under FERC jurisdiction, the state may not be able to collect fees for environmental review, as required by the Montana Major Facility Siting Act for all energy developments over 50 mW. As a result, state concerns about project siting, the need for power, and fish, wildlife and socioeconomic impacts may not be addressed adequately in the federal review process.

State officials considered the FERC environmental impact statement for the proposed Kootenai Falls project generally deficient in detail, scope and analysis. However, the project developer, Northern Lights, Inc., complied with the Major Facility Siting Act and funded Montana's preparation of an EIS. Information generated through this \$800,000 study gave a much clearer picture of the costs and benefits of the proposed dam and played an important role in the April 1984 decision by the FERC administrative law judge to deny a license for the project.

To insure adequate environmental review of major hydro projects, the Montana Department of Natural Resources and Conservation is considering methods to require funding for impact studies even when the Major Facility Siting Act does not apply to a project. This may become an important consideration in the Montana Power Company's proposed 75 mW Carter Ferry Dam on the Missouri River in Chouteau County. The company has received a FERC preliminary permit for the site and has indicated that it does not intend to comply with the state's siting act. The state of Montana, which has filed as an intervenor in the FERC proceedings, may thus find itself without funds to do the necessary studies on the proposed new dam.

Montana also has an interest in the integration of small-scale hydro development with the regional energy plan developed by the Northwest Power Planning Council. The council has recently initiated a two-year Northwest Rivers Study to document fisheries, recreation and other values of the rivers in Montana, Idaho, Oregon and Washington. The study will provide an information base for hydropower planning. So far, FERC has not addressed small-scale hydro proposals within the context of the council's energy plan or its associated fish and wildlife plan. FERC's failure to abide by these plans could reduce the effectiveness of the Northwest Power Planning Council's efforts to keep energy supplies in line with demand and to restore fishery and wildlife resources lost because of past hydropower development in the region.

Small Hydro Activity in Montana

The enactment of PURPA signaled a major congressional initiative to promote alternative energy development, including hydropower. In its rules to implement the act, FERC has established two conditions that greatly benefit small-scale renewable energy producers. First, FERC requires utility companies to purchase power from these producers at "full avoided cost" — in other words, at a rate equal to the amount the utility company would have to spend to generate additional electricity from conventional sources. Second, FERC requires the utility companies to allow small-scale power producers to interconnect with the electric utility grid. The combined effect of these rules (which were upheld by the U.S. Supreme Court in May 1983) is to guarantee a price and a market for energy produced by small-scale producers using renewable energy resources.

The passage of Senate Bill 139 by the 1981 Montana Legislature (69-3-601 et seq.) established a statewide "mini-PURPA" which, like its federal counterpart, guarantees that utility companies will purchase electricity from a qualifying facility. (A qualifying facility under the act is one which (a) produces energy from biomass, water, waste, wind, cogeneration or other renewable resources; (b) has a capacity not greater than 80 megawatts; and (c) is owned by a person not primarily engaged in electric power sales other than small power production.) The Montana Public Service Commission (PSC) sets the rates and conditions for the sale of this electricity to the utility companies from the small-scale power producers.

Small-scale hydro developers also have access to a number of additional financial incentives, including an 11 percent energy tax credit and accelerated depreciation allowance on the federal level, and industrial development financing and alternative energy grants and loans from the state.

The surge of interest in small-scale hydro was a direct result of federal and state incentives for alternative energy development. By the summer of 1982, more than 100 applications for preliminary permits had been filed

with FERC on 88 different Montana sites. Most of these applications were submitted to establish priority rights for development and were not based on studies of site characteristics or economic considerations.

As of November 1983, the Montana Department of Natural Resources and Conservation reported that 73 applications for 70 different small-scale hydro developments remained active under the FERC licensing process. Twenty-six of these proposals were for retrofits of existing dams, while 44 proposals were for new dams or diversions.

Despite the many applications, only three small-scale hydro projects had been developed through 1983. These included systems on the Philipsburg and Whitefish municipal water supplies and a diversion on Cascade Creek in the upper Yellowstone drainage. The remainder of hydro activity has been on paper only, as developers have worked through the permit process, conducted site-specific studies and, most important, waited for the Montana Public Service Commission to specify contract terms between utility companies and developers for electricity produced by small-scale hydro facilities.

During 1983, the PSC held hearings on the progress of small power production contracts and the methods of computing avoided-cost rates. In an order dated November 10, 1983, the commission found that "major problems" in the implementation of PURPA and Montana's mini-PURPA "have acted as an almost complete barrier to Montana's utilities' purchasing qualifying facility power." The PSC noted that establishment of long-term rates plays a crucial role in allowing small power producers to determine the economic feasibility of proposed projects and to obtain financing for construction. The Montana Power Company's failure to offer long-term contracts was cited by the commission as the most significant factor stifling small power production in Montana during the first two years of the mini-PURPA law.

In February 1984, the Public Service Commission announced its rate schedule for long-term purchases of energy by utilities from small power producers. The payment schedule in the Montana Power and Pacific Power and Light service areas was based on the cost of electricity from Colstrip Units 3 and 4. The figures ranged from about seven cents per kilowatt-hour for a 35-year contract to about four cents per kilowatt-hour for a four-year contract. Avoided-cost rates in the Montana-Dakota Utility service area in extreme eastern Montana were based on costs of the Antelope Valley System 2 coal-fired power plant and were slightly higher than the rates in the rest of the state.

The long-term contract rates announced by the PSC received mixed reviews from potential developers. J. Peter Gross, president of the Montana Small Hydro Association, predicted Montana would "break loose" in terms of small-scale hydro development. Gross noted that the public utility commissions in Oregon and

Washington adopted much lower rates than Montana, thus making Montana an attractive location for potential developers throughout the Pacific Northwest.

Others in the industry were less optimistic, citing lower-than-expected avoided-cost rates and continued difficulty over instream flow requirements as factors that will continue to keep the lid on small-scale hydro development in Montana.

During 1984 several contracts between hydro developers and utilities were signed in response to the new schedule of long-term rates. Other potential developers began to assess carefully the economic feasibility of their projects in relation to both the avoided-cost rate and the constraints on water withdrawals imposed to conserve fisheries. Out-of-state investors showed much interest in retrofitting existing state and federal dams to take advantage of the federal tax credits and Montana's favorable buy-back (avoided-cost) rates.

But just as the small hydro picture was beginning to clear, the Public Service Commission decided in November 1984 to reassess its method for calculating avoided-cost rates. The commission action was in response to the regional energy surplus. The commission reasoned that electricity acquired from small hydro or other alternative energy sources would not displace electricity from expensive new power plants (such as Colstrip 3 and 4); rather, the alternative energy purchases would only allow a utility to avoid buying additional electricity at the current market value of energy.

In September 1985, the Public Service Commission released its draft methodology for calculating avoided-cost rates. The resultant rates, which would fluctuate indirectly in relation to regional energy prices, were about three to four cents per kilowatt-hour, or about half the 1984 rates. Developers and utility companies would also have the option to negotiate their own rate, rather than use the "tariffed" rate.

The draft order drew strong criticism from representatives of the alternative energy industry, who claimed the low avoided-cost rates would make small hydro, wind power and cogeneration projects economically unfeasible. The order was generally well-accepted by utility representatives, who claimed that continuation of the high avoided-cost rates would have added many unnecessary alternative energy facilities to the rate base and increased electricity prices for consumers. A final order is expected to be issued in February 1986.

Future of Small-Scale Hydro

The future of small-scale hydro development in Montana will depend on the interplay of three major issues: economic viability, instream flow requirements and state-federal authority.

The Public Service Commission's revision of its methods for setting avoided-cost rates will play a key role in determining the economics of small power production. If the rates fall precipitously, planning for new hydro projects will likely come to a halt, as has happened in Oregon and Washington. If the rates are reduced only moderately, some developments may still be profitable. Proposed projects will have to be evaluated carefully; favorable site topography, a lack of environmental opposition, and ready access to the electric utility grid will be vital factors in determining project economics. Retrofits of existing dams for hydropower generation have the best probability of success because the major capital improvements are already in place and most existing dams are near electricity lines. Good opportunities for small-scale hydro development may also be found on municipal water systems, pending the results of a survey of these systems sponsored by the Bonneville Power Administration.

Instream flows recommended by the Department of

Fish, Wildlife and Parks safeguard the fishery resources in Montana's free-flowing streams. Some developers, however, have resisted these requirements, contending that the instream flows are excessive and that they make many small hydro projects infeasible. A new research project at a small hydro development in southwestern Montana could help define the specific flow requirements for trout in mountain streams and thus clarify for developers how much water their projects can divert from the stream channel. Developers also have recourse to FERC if they do not agree with state biologists' recommendations; however, it is considered unlikely that FERC would overrule the judgment of a state agency in determining instream flows.

Congressional legislation to strengthen state authority over small-scale hydro may allow Montana to take a more active role in directing development to environmentally acceptable sites. Also, the results of the Northwest Power Planning Council's river study should help influence small hydro siting. Coordinated initiatives both within and between states, however, will continue to be necessary to counter FERC's exclusive and well-established licensing authority over small-scale hydro.

Montana officials have generally expressed a desire to see the development of small-scale hydropower projects that are properly engineered and located in environmentally sound locations. With the current outlook for lower avoided-cost rates, the trend of limited construction of small-scale hydro projects will likely continue during the next decade. Only those developers who are persistent, responsive to regulatory agencies, and innovative in securing financing will likely shepherd their projects through to development. The slowdown in development should provide policymakers with the opportunity to establish a regulatory framework to manage small hydro development in Montana to meet state concerns.

MONTANA-CANADA BORDER WATER ISSUES

Montana's 560-mile border with Canada brings a new element into the discussion of the potential for state water marketing: international waters.

This international aspect of some of Montana's water supply further complicates an already complex discussion. How does water Montana shares with Canada fit into water marketing plans, and what new

problems or solutions are involved?

This section outlines what we know today of the answers, using the four categories of issues the Select Committee on Water Marketing developed: water availability; legal considerations; technical aspects; and political and economic feasibility.

WATER AVAILABILITY

In an average year, 9.74 million acre-feet of surface water flows across the Montana-Canada boundary. The majority of this — 8.75 million acre-feet — flows from Canada into Montana.

Although the volume seems high, much of this water is not available, or not attractive, for water marketing plans. The following is a basin-by-basin overview of border water availability.

Columbia Drainage

Over 90 percent of the Canadian water that flows into Montana enters through the Columbia Drainage, specifically in the Kootenai River Basin in northwest Montana. The Kootenai, Montana's third largest river, depends on Canada for about three-fourths of its volume when it exits the state at the Montana-Idaho border.

One of the prime factors making this water an unlikely prospect for water marketing is its distance from Montana's eastern coal fields, which are often cited as the best chance for a substantial water marketing program. But even if a market develops for water in Montana's northwest corner, other limiting factors in both Canada and the U.S. would come into play.

On the U.S. side, an enormous prior water right for hydropower generation at Libby Dam and a claim by the U.S. Forest Service of reserved water rights may create what amounts to an instream flow requirement. That would severely limit the supply of water for marketing.

On the Canada side, international negotiations begun in the 1960s established Canadian rights to a significant amount of basin water, traded for Canadian concessions for U.S. flood control and hydropower efficiency. When Canada exercises these rights, it will further reduce the potential marketing supply.

The Kootenai Diversion, a Canadian proposal to divert water from the Kootenai to the Columbia River for power production, is an example of a project that would use these reserved rights. First planned in the 1970s, the diversion has been postponed at least until energy markets improve. But any Montana marketing

plans must include this and similar projects as possibilities.

East of the Kootenai in the Columbia Drainage is the North Fork of the Flathead River. The Flathead, Montana's second largest river, is a tributary to the Clark Fork, Montana's largest river. But less than 5 percent of the flow of the Clark Fork at the Montana-Idaho border originates in Canada.

Montana withdrawals from the North Fork of the Flathead are effectively prohibited by a federal Wild and Scenic River designation, along with Park Service and Forest Service reserved water rights. Withdrawals in Canada are not ruled out, but the remoteness of the region has so far preserved the pristine quality of the river.

Downstream of the confluence of the North, Middle and South forks of the Flathead River, claims by the Flathead Indians constrain withdrawals. In addition, Washington Water Power owns a large right for power production at its Noxon Rapids Dam. This right to a continuous flow of 50,000 cubic-feet per second discourages new withdrawals in the entire Clark Fork drainage, except during the one month per year in which average flows typically exceed that volume.

Saskatchewan Drainage

On the east side of the Continental Divide are the headwaters of the Waterton, Belly and St. Mary rivers, Montana's sole surface water contribution to the Hudson Bay in northeast Canada. The three rivers carry about one million acre-feet of water each year.

The Belly and Waterton rivers arise in Montana, flowing through Glacier National Park until they reach the Canadian border. There are virtually no consumptive uses in Montana. In the 1940s, the International Joint Commission blocked a proposal — the All-American Tunnel and Canal — to divert water from the two rivers into the Milk River. There is little prospect for new diversions to be approved.

The St. Mary River also arises in Glacier Park. It then flows through the Blackfoot Indian Reservation before crossing into Canada. The major consumptive use of the St. Mary outside the reservation is an interbasin

diversion of irrigation water sent to the Milk River. Senior Blackfoot water rights would complicate any attempt to increase this diversion for water marketing.

The 1909 Boundary Waters Treaty declared a U.S. and Canadian agreement that, for the purposes of international apportionment, the St. Mary and Milk rivers would be treated as one river, even though the Milk is part of the next drainage to the east. Any plans to use St. Mary water would have to conform to the apportionment.

Missouri Drainage

The Milk River arises in Montana on the Blackfoot Indian Reservation; crosses into Alberta, Canada; returns to Montana northwest of Havre; and meets with the Missouri River below Fort Peck Dam.

The Milk River overlaps more than half of Montana's border with Canada. But chronic shortages of Milk water make the river unattractive for water marketing. Water shortages already occur four out of every 10 years, and these will worsen if reserved Indian rights and Canadian Treaty rights are exercised.

There have been proposals to divert water from other parts of the Missouri Drainage into the Milk to alleviate the shortages. Another possibility, at least in resolving Canadian rights, may be in cooperative state-province planning. In most years, Alberta does not use all of the Milk River water it is entitled to; Montana does not use its full share of the St. Mary. Each uses the surplus flows left by the other, although no long-term agreement

provides the stability that would be desirable for a water marketing plan.

Alberta has started studies on building a dam on the Milk to help irrigation in the region, using its unused apportionment. Depending on the way new storage facilities are handled, the project could either help or hurt Montana supplies on the Milk.

East of the Milk, two small tributaries to the Missouri River cross the international border: the Poplar River and Big Muddy Creek.

In an average year the Poplar carries under 100,000 acre-feet to the Missouri; the Big Muddy adds about 60,000 acre-feet. Canada contributes about one-third of the Poplar water, and about one-tenth of the Big Muddy. Neither watercourse has been apportioned by the International Joint Commission.

The Poplar River was a source of controversy in the 1970s as the site of a Canadian thermal power plant north of the Montana border town of Scooby. Two of the four generating units in the plant have been constructed so far, but water shortages in the area may preclude further development. Although the Poplar and Big Muddy probably do not have water available for marketing, the power plant might be a prospective buyer for water shipped in from another source, such as the Fort Peck Reservoir.

Montana-Canada transboundary basins don't seem to have immense volumes of water available for water marketing. But in several cases, a chance may exist to match reasonable sources of water with reasonable uses that would lend themselves to water marketing. Montana could look to Canada to be both a supplier of water and a buyer of water. But we must look at more than just an analysis of water availability.

LEGAL CONSIDERATIONS

The legal considerations of marketing international boundary water are defined by general international law, treaties, and domestic law.

International Law

General international law provides some broad principles for countries with shared water resources. Most important is the principle of sovereignty, where

governments exercise exclusive control over the natural resources within their national borders.

Most countries accept the concept that sovereignty is limited with respect to waters flowing across international boundaries, in that these waters should not be used in one country in a way that harms another.

If one country abuses water, in theory the injured country can claim damages from the offending country. In practice, there is little chance of legally enforcing this concept. If Canada wanted to market water to the detriment of the U.S., or vice versa, political pressure against or for the move would probably be a greater factor than the broad dictates of international law.

Treaties

The 1909 Boundary Waters Treaty defined transboundary water practices between Canada and the U.S. The treaty delegated exclusive control over the use of boundary waters to the government of the jurisdictions through which they pass. The treaty also created the International Joint Commission (IJC) to help resolve boundary water disputes.

The 1909 treaty deals generally with the downstream effects of water development, but the IJC functions as an investigator and a mediator to help resolve specific disputes. It would probably serve in these roles if a water-marketing dispute surfaces.

The 1964 Columbia River Treaty provides an additional layer of international law covering Montana's westward-flowing rivers. This treaty included Canada's agreement to allow several dams in its territory to improve flood control and hydropower generation downstream in the U.S. In exchange, Canada received promises of certain water rights.

The treaty provides for a Canadian diversion of a significant volume of water from the Kootenai into the Columbia River in the future. Aside from this, it protects the right to divert waters in the Columbia Basin for consumption, but does nothing to apportion other border water. While it can't resolve all disputes, the Columbia River Treaty can serve in some ways as a model for integrated river development.

Domestic Law

The domestic laws in the U.S. and Canada provide more specific guidelines for boundary waters than do

international principles, but they still fall far short of a comprehensive, enforceable plan.

In Canada, provinces have clear title to the water resources within their borders; the federal government must approve agreements on water that crosses a border.

In the U.S., state and federal titles to water are less clearly defined, although the federal government clearly has sole authority for foreign relations, and federal decisions here will prevail over state law.

The U.S. government also regulates international commerce, an important consideration in border water marketing, and it retains substantial financial control over many major water projects. Reserved water rights for certain federal lands and lands held in trust for Indian tribes also come under federal authority. All of these factors limit the state's traditional authority for water management.

When it comes to water resources, Canadian provinces exercise greater authority relative to their federal government than do their state counterparts. But provinces still face federal roadblocks. The Canadian Water Act, for example, focuses on cooperative arrangements among provincial and territorial water managers for fair treatment of Native concerns. Because most Native people in Canada are northerners, dependent on land and surface water for their livelihood, their role in water management may be crucial.

On the U.S. side, the Fort Peck Reservoir in the Missouri Basin has been mentioned as a possible supply of water for sales to Canada. But the O'Mahoney-Milliken Amendment to the 1944 Flood Control Act, which protects consumptive uses for upstream Missouri River Basin states, applies only if the use occurs in one of the western states. A sale of Fort Peck water to Canada might be vulnerable to a legal challenge, while the same sale to Texas might not be.

TECHNICAL ASPECTS

From a technical standpoint, most of Montana's international boundary waters are not in a prime situation for water marketing. However, some interest has been expressed in such projects.

Shell Oil has explored using the former Northern Tier Pipeline route for a coal slurry line to connect eastern

Montana's coal fields with West Coast ports for shipping to Pacific Rim markets. West Slope water in Montana could be sent directly to the coal fields for the slurry, or the coal could be shipped by rail to the Continental Divide and then made into slurry. The second option could reduce opposition from the railroads, a strong

opponent of previous slurry proposals; slurry pumping costs would also drop.

Another marketing proposal would be to increase the diversion of water from the St. Mary River to the Milk River. While this would not ordinarily be considered an international water marketing plan, it could become one if the Blackfeet Indians succeed in asserting rights in the St. Mary River. Canada would be involved then because the water would be conveyed across, and perhaps stored in, Alberta.

In engineering terms, the Fort Peck Reservoir offers southern Saskatchewan an excellent potential water supply. The region, just north of eastern Montana, is perhaps Canada's most arid. Its coal and potash reserves would need additional water for large-scale development.

Fort Peck is as close to this potential market as it is to Montana's southeastern coal fields. And it would take less energy to lift water to this region of Saskatchewan north from Fort Peck than south from southern Saskatchewan's larger lakes and reservoirs.

Canadian water is already being marketed in a small way in Montana. In 1960, Sweetgrass, Montana agreed with Coult's, Alberta to exchange U.S. electricity and natural gas service for Canadian water for municipal use. Similar sales or exchanges along the border might offer the simplest technical answer to local water shortages.

Often when people discuss marketing water over the international border, they refer to massive, continental-scale projects. The North American Water and Power Alliance (NAWAPA) scheme is typical. NAWAPA would divert several north-flowing rivers in Canada to the western U.S., with a courtesy diversion to the Canadian prairies along the way. First proposed in the 1960s, it has died and been revived on numerous

occasions. It would face great public opposition in Canada, but indications are that some Canadian government officials are not opposed to such a plan. Certainly water-short southern and midwestern U.S. states would not be opposed, if the obvious engineering difficulties of such a massive project could be resolved.

Apart from the engineering difficulties, critics assert that such a large interbasin diversion would entail large environmental impacts. The Garrison Diversion Unit (GDU) controversy illustrates the difficulty of resolving environmental disputes over boundary water.

The GDU is related to the Garrison Dam, which was built in North Dakota on the Missouri River under the 1944 Flood Control Act. The U.S. government promised North Dakota compensation for its loss of land submerged by the dam: irrigation projects to open large arid regions for agriculture.

In 1965, Congress authorized the GDU, which was projected to irrigate 250,000 acres on 1,200 farms, to help fulfill that promise. The GDU today is only 15 percent completed, with further progress stalled by controversy over potential environmental impacts in Canada.

The problem revolves around the fact that Missouri River Basin water would be irrigating land in the Hudson Bay Drainage. Unconsumed water would runoff to Canada via the Souris and Red rivers; Canada fears that the interbasin transfer would bring unwanted new fish species, diseases and chemicals that could harm a valuable commercial fishery. The controversy over the GDU has not yet been resolved.

Our knowledge of the environmental impacts of a project of this scale is limited. The potential impacts of a continental-scale project such as NAWAPA are open to even more dispute. The only thing sure is that the answers would have to satisfy both countries.

POLITICAL AND ECONOMIC FEASIBILITY

A traditional analysis of the political and economic costs and benefits of a water marketing proposal would add all the benefits of the project, and subtract from that total all the costs of the project. If the result is positive, the analysis would recommend the project should be constructed. If the result is negative, the project should not be constructed. The international border changes all this.

In the case of a domestic water project, all the permits

and approvals are issued or denied by the host country; the impacts of the project may not respect the border, however. That domestic project may receive approval if the net benefits to the host country exceed the net costs to the host country, regardless of the costs to the neighboring country.

In the case of an international water project, both countries must issue permits or approvals. But each analyzes the proposal to see if it would provide a benefit

to its own country, and requires that benefit before granting approval. A large benefit in one country is not enough to outweigh a small cost to the other country; both countries must be satisfied. Potentially a project with a strong net benefit can be denied.

Another economic and political factor for Montana to consider is the potential for competition from Canada. If a Montana water marketing scheme proves successful, might not Montana inadvertently open the door for gigantic diversions from the north to water-hungry southern and western states? By virtue of its large supply and relatively low opportunity cost, Canada may be able to divert water great distances over major obstacles.

Even if this is of little concern in terms of Montana's water markets (which should be relatively small and secured with long-term contracts), Montana could find large new pipelines, pumping stations and reservoirs imposed upon it by the federal government under pressure from water-hungry regions.

It is important, then, to gauge the political likelihood of Canadian water exports. By all accounts, the present Canadian political environment is not conducive to such

exports. And much of the existing demand is for relatively low-cost uses, such as irrigation. Higher value uses will have to demand much more water before political opposition to a megaproject transfer scheme can be overcome.

Still, Canadian water policy experts cite three factors that could prompt Canada to export water: pressure from the United States; pressure from central Canada (Ottawa); and the failure of a provincial interbasin transfer (leaving plans or facilities searching for new markets).

None seems likely in the near future. Diversion proposals in the U.S. have received little support from the federal government. Canadian water policy is in disarray, without good inventories or projections. And existing megaprojects seem effectively stalled.

This means that, even if Montana expects a financial windfall from a water marketing scheme involving water it shares with Canada, approval from across the border is not guaranteed. Montana must plan on including international considerations in any scheme to use such water.

John E. Thorson

THE PUBLIC TRUST CHAUTAUQUA COMES TO TOWN: IMPLICATIONS FOR MONTANA'S WATER FUTURE

Montanans have lived for many years with uncertainties in their water rights system caused by varying and often sweeping assertions of Indian, federal reserved,¹ and federal nonreserved² water rights. Their water policy has also been heavily influenced by the massive federal presence on the Missouri River in the form of several reservoirs on the mainstem. For these reasons, the debut of the public trust doctrine (made famous in Chicago and California) in two recent decisions of the Montana Supreme Court³ is bound to receive suspicious if not critical reviews. Yet, while the recognition of the doctrine may "muddy" Montana water law over the near term (especially as it pertains to potential intra- and interstate diversions, the doctrine actually invites and supports a stronger state government role in the development of a water policy

that will provide a balance between traditional and important evolving uses, between present and future generations, and between the needs of Montana and the needs of other states in the region.

The first part of this paper presents a primer of the origin and apparent direction of the public trust doctrine. The second part of the paper discusses in more length some of the important features of the doctrine. The third portion of the paper explores some of the ramifications the doctrine may have for the various policy options being considered in this seminar. The paper closes with a general discussion of the implications the doctrine has for state government as it makes decisions concerning important "common heritage" resources.

EVOLUTION AND SCOPE OF THE PUBLIC TRUST DOCTRINE

Civil and Common Law Roots

The public trust is a longstanding doctrine having its roots in both civil and common law. The doctrine requires a high level of care (in essence, a fiduciary obligation) by government as it deals with the resources of "common heritage" or of "special character" within its jurisdiction. Historically, the doctrine has been applied to protect public uses and access to and upon navigable waters for passage, commerce and fisheries. These roots, however important in understanding the origin and development of the doctrine, should not mislead policymakers as to how the essential purpose of the principle may be applied in contemporary situations. Although the doctrine evolved with reference to navigable waters and to economic and subsistence uses, the rationale behind the doctrine may equally apply to other natural resources and to guard more contemporary uses.⁴

The Institutes of Justinian, in restating Roman law, provides the civil law origins of the doctrine: "By the law of nature these things are common to man—the air, running water, the sea and consequently the shores of the sea."⁵ As one author indicated:

All rivers and ports were public, and the right of fishing was common to all men. Any person was at liberty to use the seashore to the highest tide, to build a cottage or retreat on it or to dry his nets on it, so long as he did not interfere with use of the sea or beach by others. Although the banks of a river were subject to private ownership, all persons had the right to bring vessels to the river, to fasten to them by ropes and to place any part of their cargo there.⁶

The same principles were recognized in early English law. But, because the common law abhors ownerless things, the common property notions of the Roman law had to be adapted to this new situation. A solution was found, however, in attributing ownership to the King. Thus, "all things which relate peculiarly to the public good cannot be given over or transferred . . . to another person, or separated from the Crown."⁷

Early American Applications

Applications of public trust considerations in America have been made since the early days of the colonies. The Massachusetts "great pond" ordinance of 1641 guaranteed the right to fish and fowl in the ponds of 10 acres or more, as well as access through private property to enjoy that right. In its passage of the Northwest Ordinance of 1787, Congress guaranteed that "the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways, and forever free. . . ." The New Jersey Supreme Court, in 1821, recognized that the states had succeeded to the rights of the British Crown in publicly important waters and that

[T]he sovereign power itself . . . cannot, consistently with the principles of the law of nature and the constitution of a well ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of their common rights.⁸

An important public trust case of the 19th century eventually reached the U.S. Supreme Court: *Illinois Central Railroad v. Illinois*.¹⁰ In 1869, the Illinois legislature granted to the Illinois Central Railroad 1,000 acres of tide and submerged land representing virtually all of Chicago's waterfront. The railroad was only limited in that it could not obstruct the harbor or impair the public's right to navigation. Also, the legislature retained the right to regulate wharfage fees when docks were built.

Thinking better of the transaction, the legislature later rescinded the grant; the legality of the rescission (with nothing more than incidental compensation) was upheld by the U.S. Supreme Court in 1892. The court declared that one legislature does not have the power to "give away nor sell the discretion of its successor" to "exercise the powers of the State" in the execution of the trust and that legislation "which may be needed one day for the harbor may be different from the legislation that may be required at another day." The court did recognize, however, that some parcels on the waterfront

could be granted free of the public trust as long as they furthered trust purposes.

Other applications of public trust considerations have been made in Massachusetts litigation to invalidate excessive delegations of authority to a private company to develop and operate a state park and ski area;¹¹ in Wisconsin cases to invalidate legislation that had authorized a private developer to drain a lake for a housing development, and to deny local government power to use a fishing stream for incompatible electric power generation;¹² in a Pennsylvania ruling that, where destruction of a public resource is justified because of an overriding public purpose, there should be reasonable efforts toward mitigation;¹³ in North Dakota where a court prevented the issuance of water appropriation permits for coal generation facilities until a comprehensive water use plan was completed taking into account instream uses such as navigation, commerce and fishing;¹⁴ in a New Jersey Supreme Court decision recognizing the public's ancillary rights of both reasonable access to and use of privately owned portions of beach areas to enjoy tidelands;¹⁵ and in a 1984 decision of the Idaho Supreme Court recognizing the public trust doctrine in that state but upholding a grant by the state lands department of a lease to a private club for the construction of a private docking facility on a navigable lake (on the basis that a fee simple interest was not being conveyed).¹⁶

Mono Lake Litigation

The California Supreme Court's decision in *National Audubon Society v. Superior Court*,¹⁷ however, is the most sweeping declaration of public trust considerations. The case, decided in February 1983, signals an important integration of the public trust doctrine with the prior appropriation doctrine applied in California, Montana and other Western states.

The facts of *Mono Lake* are the water history of Los Angeles itself. In 1913, Los Angeles completed its first aqueduct from the Owens Valley to the east and eventually dried up Owens Lake. In 1933, the city applied for (and in 1940 received) a state permit to divert unappropriated waters in four of the five tributary streams serving Mono Lake lying east of Yosemite. The state agency knew environmental damage would occur from granting the water permit, but the agency believed that it had no authority to prevent or minimize that damage. For the next 20 years, however, Los Angeles used little of these waters.

In the early 1960s, the state warned Los Angeles that its Mono Lake right would have to be put to use or would be lost. By 1970, Los Angeles had completed a second aqueduct to the Owens Valley enabling it to take its full Mono Lake entitlement. The result has been that,

in the last 10 years, the surface of the lake has diminished by about 30 percent and the surface level has dropped approximately 40 feet. The brine shrimp of the lake, upon which numerous bird species depend, has been threatened by increased salinity. The birds, including a large breeding colony of California gulls, have also lost safe habitat as a once-protected island has become connected with the main shore. Air quality has deteriorated as alkaline flats have become exposed to the wind.

In its February 1983 decision, the California Supreme Court held that the public trust doctrine does apply in this case so as to protect the navigable waters of Mono Lake from harm caused by diversion of non-navigable tributaries. The doctrine protects changing public needs for ecological preservation, open space maintenance, and scenic and wildlife needs—as well as the traditional concerns of navigation, commerce and fishing. The state, as public trustee, has a *continuing duty* to protect the people's common heritage of streams and lakes through continuing administration of the trust, including possible revocation of existing rights without compensation.

Thus, read broadly, water rights in California's appropriation system cannot be acquired independently of the public trust. Water rights are never vested; they can and should be reconsidered on a public interest basis. At least in California, courts have concurrent jurisdiction with administrative agencies to make these determinations, although courts should defer to agency expertise whenever possible. In *Mono Lake's* case, the court directed that some responsible agency review the merit of Los Angeles' diversions.

The Curran and Hildreth Decisions of the Montana Supreme Court

The Montana Supreme Court has recently reached two decisions recognizing the public trust doctrine in Montana law. In both *Montana Coalition for Stream Access v. Curran* (Dearborn River)¹⁸ and *Montana Coalition for Stream Access v. Hildreth* (Beaverhead River),¹⁹ the court held that the public is entitled to recreational use of all of Montana's waters that are capable of such use. The limit of the public's right to use these waters is, under normal circumstances, the high water mark. The public may cross private property in order to portage around barriers in the water, but the portage must be accomplished in the least intrusive manner.

The court's holding is based on Article 1X, Section 3 of the Montana Constitution ("All . . . waters . . . of the state are the property of the state for the use of its

people. . . ") and the public trust doctrine.

In both recent decisions, the court carefully and explicitly pointed out that its recognition of the public trust doctrine *does not* thereby grant public access over private property to reach state-owned waters used for recreational purposes. This position runs counter to the general trend of public trust cases to allow such reasonable access.

author argues that there are two reasons such coverage might eventually occur. In the *Mono Lake* case, the court applied public trust criteria to the diversions from non-navigable tributaries because of the resulting effect on the navigable lake. Similarly, the pumping of tributary groundwater²⁰ may adversely affect navigable waterways. Second, the "common heritage" rationale may apply to important aquifers in their own right and public trust protection would be afforded without reference to a navigability requirement.

Groundwater: Future Extension of the Public Trust Doctrine?

While at first blush it might appear that the public trust doctrine has no application to groundwater, one

IMPORTANT COMPONENTS OF THE PUBLIC TRUST DOCTRINE

From our discussion thus far of the public trust doctrine, numerous features of the doctrine have been mentioned. Before proceeding to an examination of the implications of the doctrine for Montana's water policy, it is necessary to focus on the important core features of the concept.

legislature may be unable to restrict or limit the public trust, legislators are free to enact measures, such as scenic or in-place protection statutes, to more specifically assert or characterize the right.

Legal Basis: Constitutional, Statutory or Other?

The public trust does not neatly fit as a common law, constitutional or statutory doctrine. As one author indicated, "The public trust appears to be an expression of the inherent prerogative of the sovereign to restrict or reallocate property rights to protect the integrity of the 'special' or 'common heritage' natural resource."²¹ As such, the doctrine may be extra-constitutional in that "neither a statute nor a constitutional provision can authorize the granting of property rights 'vested' so as to protect them from reexamination."²² But, while a

Requirement of Navigability

As previously mentioned, the public trust doctrine has been linked from its origins to navigable waters. Although various tests ("log-floating" or "pleasure boating") have been applied by courts as a prerequisite to public trust protection, recent holdings, such as *Curran* and *Mono Lake*, seem to indicate that navigability is simply an indicator for a more important and basic concern: Is the resource invested with major public importance? If so, the courts appear ready to strain in applying public trust protection even if the linkage to navigability is tenuous. It would not be surprising to see the navigability requirement dropped entirely by the courts in favor of a more accurate and focused examination of the extent of the public's interest in continued use of a resource.

Is the Public Trust a Navigation Servitude, an Easement or a Riparian Right?

Public trust considerations are often applied by courts under such different nomenclature as “easement,” “navigation servitude,” “riparian right” or other terms. In most cases, these concepts act toward the same end, *i.e.*, protection of public uses; the public trust doctrine can be considered the general, encompassing category. There are, however, some distinctions. For instance the existence of a navigation servitude imposes a dominant easement on navigable water beds without regard to the source or intervening chain of title as to those lands. Also, riparian rights are recognized only in three western states (California, Oregon and Washington). For our purposes in this paper, the concepts are interchangeable to the extent they recognize public interest in a resource.

Relationship of the Public Trust Doctrine to the Prior Appropriation System

Several commentators²³ see *Mono Lake* as an important benchmark in the development of western water law. From the gold rush to the post-war years, the appropriation doctrine reigned supreme and indispensable to the development of the West. Appropriators were generally limited only by the rights of more senior holders.

We now witness the integration of public trust considerations with the appropriation system. In this phase, “the police power [of the state] has overtaken, controlled and constrained the prior appropriation doctrine, authorizing and now directing a reallocation of resources to consider public, non-proprietary concerns.”²⁴

Prospective or Retroactive Application?

The public trust is both a prospective and retroactive doctrine. While it is important that future water

appropriations be screened and conditioned on public interest criteria, many states are already incorporating such criteria into their permit procedures. Also, application of the doctrine to future appropriations does not disrupt settled expectations or existing water uses.

What Can or Must a State Do?

A state as trustee has “an affirmative duty . . . to protect public trust uses whenever feasible.”²⁵ In a state that recognizes the doctrine, its agencies, courts or both have the ability to reexamine and modify (usually without compensation) existing water uses. Especially in tidelands cases, it is probably rare that a court would countenance a transfer of public rights free of the trust and then only if the transfer furthers public trust purposes. If *Mono Lake* is a guide, courts may be more lenient in inland water cases. As indicated in that case, the:

. . . prosperity and habitability of much of this state requires the diversion of great quantities of water from its streams for purposes unconnected to any navigation, commerce, fishing, recreation, or ecological use relating to the source stream. The state must have the power to grant nonvested usufructory rights to appropriate water even if diversions harm public trust uses.²⁶

When transfers out of trust occur in inland water cases, the court will apply a decision checklist to the transaction that may include the following considerations:

1. Has the decision-making been broad-based and explicit? That is, has an important case been made for the transfer or development? Has the legislative body been explicit (thus knowledgeable) about what it is giving up?
2. Related to the first, has there been comprehensive planning for or consideration of important in-place or instream uses of commerce, navigation, recreation and ecological protection?
3. If the transfer or development has been properly allowed, will there be sufficient mitigation?

When a court is able to consider the full range of factors that must be evaluated (including the opportunity costs to the parties), then the court may, on its own, determine whether public trust resources have been properly committed to private or specialized public uses. If judicial consideration of the range of factors is not possible, a court is likely (as in the *Mono Lake* decision) to enjoin the appropriation or to mandate public trust scrutiny by a legislative or other body that has the capacity to discover and consider all relevant factors.

PUBLIC TRUST IMPLICATIONS FOR A STATE'S WATER POLICY

Committee members are, of course, most concerned as to how the public trust doctrine relates to their task of evaluating the merits of water-marketing proposals, out-of-state diversions and Montana water policy generally. The first part of this section discusses the possible constraints the doctrine places on state decision makers as they consider diversions (whether in-state or out-of-state) for coal slurry or similar industrial purposes. The second part of this section discusses the considerations the doctrine holds for each of the major public policy options being presented at this seminar: free market, state marketing, state permit system and interstate allocation.

Implications of the Public Trust Doctrine for Water Marketing Programs

This committee has been empaneled to "study the desirability and feasibility of in-state and out-of-state marketing of limited amounts of water for industrial purposes." The public trust considerations for such marketing are different depending on (1) whether the marketing is of currently appropriated or unappropriated waters; (2) the type of diversion; and (3) who does the diversion.

Unappropriated or Appropriated Waters

If currently unappropriated waters are slated for sale and diversion, the public trust doctrine has prospective application requiring that existing public uses in the waters be protected. If waters are being used for navigation or recreational purposes, if fragile ecological systems depend on the present flow or location of the water, or if the flow is low or unstable, only minimal diversions will be tolerated under the doctrine. The use of proceeds from the water sales may be a consideration that will convince a court to allow significant interference with public rights. If proceeds from the sale

are invested back into the resource (*e.g.*, recreational facilities elsewhere, wildlife habitat protection) or dedicated to a permanent "heritage" trust fund (*e.g.*, the Montana coal severance tax fund), a court would be more likely to countenance diversions that will interfere with existing public rights. In the case of all such prospective diversions, however, a state legislature has the opportunity to fashion the relevant and important public interest criteria into its permit or appropriation scheme.

The sale and diversion of existing appropriated rights usually involve change of use applications processed through a state administrative agency. Typically, such change of use applications have been approved as long as they have not caused injury to other users. The public trust doctrine requires that the agency evaluate the application in view of public uses as well as the uses of other appropriators. Also, the doctrine imposes an affirmative obligation on the agency to review existing appropriations for interference with public trust purposes and to modify or rescind an appropriation or change of use when it becomes destructive to public uses. Again, this is an area where a legislature has an opportunity to refine public interest criteria and procedure.

The Type of Diversion

The type of diversion facility used for a water-marketing program is also important in calculating the public trust considerations. If a reservoir is built on the mainstream to capture water for sale and diversion, the construction might interfere with fish and wildlife habitat, free navigation (including rafting, canoeing, and fishing) and other public uses. Reduced downstream flows might be sufficient to satisfy existing appropriated rights but still damage similar downstream public uses.

Offstream storage for marketing and diversion purposes would seem to fare better under public scrutiny. While sufficient water must be left in the stream for public purposes, the possible destruction of public uses and natural values by submersion is removed.

Who Does the Diversion?

In a state that recognizes the doctrine, public trust scrutiny applies to an attempted or existing diversion from publicly important streams or lakes by individual, state or local appropriators. The difficulty arises, however, when the diversion is proposed or has been accomplished by a federal agency or an Indian tribe in exercise of its reserved water rights. Even when permit applications and adjudications involving federal rights take place in a state forum, the public trust doctrine must generally yield to federal law under the supremacy clause. Some federal statutes, however, allow state law to control federal diversions. For example, Section 8 of the Reclamation Act²⁷ allows state law to govern diversions by the Bureau of Reclamation unless “inconsistent with clear congressional directives.”²⁸ In this instance, a state-recognized public trust doctrine could conceivably apply to condition or limit certain federal diversions.

Implications of the Public Trust Doctrine for Water Policy Options

As part of the committee’s investigation, broader water policy options are being considered. For instance, should water be allocated through a water market, through a state regulatory system, or through a state marketing system? Also, should the state seek an interstate allocation of Missouri River water? The public trust doctrine may have implications for these policy alternatives as well.

Free Market

Proponents of water-marketing systems advocate the exchange of water rights by private individuals who are generally unrestricted as to what purpose the water might be used for, where it is to be used and to whom it might be leased or sold.

Pertaining to important public waters, the public trust doctrine could be used to prevent the “privatizing” of the resource; to void the title, perhaps even without compensation of a private holder; or, at least, to condition private uses so that they will not interfere with public uses.

State Regulatory System

As previously mentioned, the public trust doctrine imposes on a state a continuing duty to review proposed and existing uses of publicly important waters for the protection of those public uses. In a water system regulated by a state agency, public interest criteria based on case law, statutes and agency rules would be expected to be used in reviewing permit applications and existing uses.

State-Controlled Market

A state cannot escape public trust scrutiny when it acts to appropriate certain waters for its own use or for the transfer (at the present or in the future) to private parties. A state-controlled market would, however, give the state greater ability to fashion the uses of its waters by deciding to whom rights will be transferred.

Interstate Allocation

There is the possibility of an interstate allocation of Missouri River water through an equitable apportionment action before the U.S. Supreme Court, by Congress, or by interstate compact. While Montana is in a favorable upstream position, questions still arise: If Montana needs or reserves certain waters to secure public trust purposes (usually instream), will that use or reservation be recognized or honored in an apportionment of Montana’s share of Missouri water? If subsequent changes in the public interest allow the diversion of water out of the streambed, thereby reducing downstream flows upon which others rely, who has interstate priority of use? If downstream states recognize the public trust doctrine, can Montana appropriate and put to consumptive use waters necessary to serve those downstream public uses?

There are no easy answers to these questions. If interstate apportionment comes about through congressional action or interstate compact, recognition for Montana’s public trust needs will depend in large part on political leverage and how convincing the state is in articulating the needs as integral to Montana’s water policy. If interstate apportionment is attempted through Supreme Court litigation, however, the situation is more uncertain. The U.S. Supreme Court has ruled that the principles of prior appropriation apply in an interstate equitable apportionment action. Thus, it is possible that Montana’s public trust waters would not receive Supreme Court acknowledgment against appropriations by downstream states.

CONCLUSION: IMPLICATIONS FOR STATE DECISION-MAKING

While the public trust doctrine had its origins in navigable waters and commercial or subsistence uses, it is becoming clear that the concept is being recognized for its more fundamental importance. The author most identified with the concept, Joseph Sax, puts it this way:

The central idea of the public trust is preventing the destabilizing disappointment of expectations held in common but without formal recognition such as title. The function of the public trust as a legal doctrine is to protect such public expectations against destabilizing changes, just as we protect

conventional private property from such changes. So conceived, the trust doctrine would serve not only to embrace a much wider range of things than private ownership, but would also make clear that the legal system is pursuing a substantive goal identical to that for the management of natural resources. Concepts like renewability and sustained yield, so familiar to us in fisheries and forest management, are designed precisely to prevent the sort of sudden decline in stocks that is destabilizing and crisis-provoking.²⁹

FOOTNOTES

- Indian and other federal reserved rights are recognized by the courts as overarching rights to the water necessary to serve the primary purposes of a federal land reservation — be it an Indian reservation, a park, or a national forest. They generally have early priority dates and unsettled scope. See *Winters v. United States*, 207 U.S. 564 (1908) and *United States v. New Mexico*, 238 U.S. 696 (1978).
- "Nonreserved" federal water rights refer to a now discredited claim by some federal agencies to the additional waters necessary to fulfill the subsidiary or evolving mission of the agency. Strongly asserted during the Carter Administration, the doctrine was withdrawn by the Department of Interior in September 1981 and finally put to rest Administration-wide in a legal memorandum issued by Theodore Olson, then-Assistant U.S. Attorney General for Legal Counsel.
- Montana Coalition for Stream Access v. Curran*, No. 83-164 (Mont., May 15, 1984); *Montana Coalition for Stream Access v. Hildreth*, No. 83-174 (Mont., Jun. 21, 1984).
- See, e.g., C. F. Wilkinson, "The Public Trust Doctrine in Public Land Law," 14 U.C. *Davis L. Rev.* 269 (1980).
- The Institutes of Justinian* 2.1.1 (T. Cooper, trans. & ed. 1841).
- J. Stevens, "The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right," 14 U.C. *Davis L. Rev.* 195, 197 (1980).
- 2 H. Bracton, *On the Laws and Customs of England* 16-17 (S. Thorne trans. 1980).
- Ch. 8, Stat. 50 (1789).
- 6 N.J.L. 1, 78 (1821).
- 146 U.S. 387 (1892).
- Gould v. Greylock Reservation Comm'n*, 350 Mass. 410, 215 N.E. 2d 114 (1966).
- Priewe v. Wisconsin State Land & Improvement Co.*, 93 Wis. 534, 67 N.W. 918 (1896).
- Payne v. Kassab*, 11 Pa. Commonw. Ct. 14, 312 A.2d 86 (1973), aff'd, 468 Pa. 226, 361 A.2d 263 (1976).
- United Plainsmen Ass'n v. North Dakota State Water Cons. Comm'n*, 247 N.W. 2d 457 (N.D. 1976).
- Matthews v. Bay Head Improvement Ass'n*, No. A-104, slip op. (N.J. Feb. 2, 1984).
- Kootenai Environmental Alliance v. Panhandle Yacht Club*, No. 13390, slip op. (Idaho 1984).
- 33 Cal. 3d 419, ____ Cal. Rptr. ____, ____ P.2d ____ (Feb. 1983).
- No. 83-164, slip op. (Mont. May 15, 1984).
- No. 83-174, slip op. (Mont. Jun. 21, 1984).
- E.g., *Paradise Rainbows v. Fish & Game Comm'n*, 148 Mont. 412, 421 P.2d 717 (1966) (public's right to have sufficient water left instream for protection of trout).
- Ch. 8, 1 Stat. 50 (1789).
- I.e., hydrogeologically interrelated with surface streams.
- H. Dunning, "The Mono Lake Decision: Protecting a Common Heritage Resource from Death by Diversion," 13 *Env'tl. L. Rev.* 10144, 10147 (May 1984). The doctrine "expresses an inherent aspect of sovereignty, and thus is in some ways beyond modification by the legislature." *Id.* at 10146.
- Id.* at 10148.
- H. Dunning, *supra* n. 23, at 10148-10149; A. Rossman, "Public Trust in Appropriated Waters: California Supreme Court Decides Mono Lake Case," *Western Natural Resource Litigation Digest* 13 (Spring 1983).
- A. Rossman, *supra* n. 25, at 18.
- 33 Cal. 3d at 446, 658 P.2d at 728, 189 Cal. Rptr. at 365.
- Id.* at 426, 658 P.2d at 712, 189 Cal. Rptr. at 349.
- 43 U.S.C. 383 (1976).
- California v. United States*, 438 U.S. at 672 (1983).
- J. Sax, "Liberating the Public Trust Doctrine from Its Historical Shackles," 14 U.C. *Davis L. Rev.* 185 (1980).

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MONTANA WATERWAYS, THE MONTANA SUPREME COURT AND THE PUBLIC TRUST DOCTRINE

Decisions of the Montana Supreme Court handed down May 15 and June 21, 1984, rely on the public trust doctrine and the Montana Constitution of 1972 in holding that "any surface waters that are capable of recreational use may be so used by the public without regard to streambed ownership or navigability for nonrecreational purposes." In each instance, the

Supreme Court affirmed district court decisions that had held that the public has a right to use river waters and streambeds up to the high water mark because the waters were navigable for recreation purposes. There are distinctions in the waterways, in the district court holdings, and in the Supreme Court decisions, and those distinctions are summarized here.

MONTANA COALITION FOR STREAM ACCESS V. CURRAN

District Court, First Judicial District: Curran

In *Montana Coalition for Stream Access v. Curran*¹, the First Judicial District Court found statutory grounds for recreationists' access to the Dearborn River in three sections of the Montana Code Annotated: 87-2-305 (declaring navigable rivers, sloughs and streams to be public waters for the purpose of angling), 85-1-112 (all rivers and streams that are navigable in fact are navigable) and 85-1-111 (navigable waters and all streams of sufficient capacity to transport the products of the country are public ways for the purposes of navigation and such transportation). The court found, as a matter of fact, that the Dearborn was navigable for recreation purposes, and stated that the practical rule should be:

A Montana stream is navigable and accessible for recreational purposes over so much of its entire course as is navigable by recreation craft at any given time. Over the length of such course, the stream may be utilized between ordinary high water levels by aquatic recreationists without interference from riparian proprietors. Once recreational navigability is established, access is not limited to water craft. The angler may wade between the high water lines, and if there is adequate dry footage below such lines the hiker may walk.

The Dearborn River was also found to be navigable for title purposes according to the federal commercial use test because at the time of statehood, the river had been used for moving logs and railroad ties downstream. Consequently, under well-established doctrine, the bed of the river had belonged to the state of Montana since 1889². In a subsequent section of the opinion, the District Court re-emphasized reliance on statutes, and declined to find state constitutional grounds for recreational access to the Dearborn or other waters of the state. The District Court approvingly cited the

Montana Supreme Court's 1925 decision in *Herrin v. Sutherland*³ that "... the public have no right to fish in a non-navigable body of water, the bed of which is owned privately." It is to be noted, however, that having determined navigability on the basis of recreational use, the reach of *Herrin v. Sutherland* had been sharply limited.

The Montana Supreme Court: Curran

On appeal, the Montana Supreme Court affirmed the District Court's application of the federal test of navigability for title, and consistently with the District Court, drew a sharp line between the federal law tests for navigability for title and state law tests for navigability based on public recreational use. Unlike the District Court, the Supreme Court found the bases for its decision in the public trust doctrine and in the 1972 Montana Constitution. The court drew its explanation of the public trust doctrine from principal United States Supreme Court decisions relating to the transfer of navigable waters and the soils under them from the federal government to the states at the time of statehood. Central to those cases is the proposition that during the territorial period, the waters and streambeds of navigable waterways were held in trust for the future states to be "dealt with for the public benefit" by the states after their admission to the Union. Although the court pairs the public trust doctrine with the equal-footing doctrine as considerations in determining navigability-for-title questions, it does not confine its treatment of the public trust doctrine to waters found navigable under the federal trust. The development of the court's broader application of the public trust doctrine encompasses recognition of the increased tendency for states to find navigability for recreational use as well as for commercial navigation and the substitution of an inquiry as to whether water is susceptible to public use for earlier inquiries into navigability and title to streambeds.

At this point the Montana Supreme Court set forth the language of Section 3 (3), Article IX of the 1972 Montana Constitution:

All surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial uses as provided by law.

As for rights on the Dearborn, the Supreme Court found that Curran had no right of ownership to the riverbed or surface waters because ownership was held by the federal government prior to statehood in trust for the people, and title was transferred to the state upon statehood "burdened by this public trust." Under the Montana Constitution, Curran had no right to control the use of the surface waters of the Dearborn to the exclusion of the public "except to the extent of his prior appropriation of part of the water for irrigation purposes."

Looking beyond the Dearborn situation, the court stated:

In essence, the question is whether the waters owned by the State under the Constitution are susceptible to recreational use by the public. The capability of use of the waters for recreational purposes determines their availability for

recreational use by the public. Streambed ownership by a private party is irrelevant. If the waters are owned by the State and held in trust for the people by the State, no private party may bar the use of those waters by the people. The Constitution and the public trust doctrine do not permit a private party to interfere with the public's right to recreational use of the surface of the State's waters. (Emphasis added)

To the Montana Supreme Court in the spring of 1984, the portion of the 1925 *Herrin v. Sutherland* decision prohibiting fishing in waters over a streambed in private ownership appeared to have no application in *Curran*. It was dismissed as irrelevant and contrary to the public trust doctrine and the 1972 Montana Constitution.

Drawing on both statutes and case law, the court held that the public has a right to use state-owned waters to the point of the high water mark. In case of obstructions in the water, the public was to be allowed to portage around the barriers in the least intrusive way possible. Despite the breadth of the declaration of public rights in the state's waters, the court's order states unequivocally that the public does not have the right to enter into or trespass across private property in order to enjoy the recreational use of state-owned waters.

MONTANA COALITION FOR STREAM ACCESS V. HILDRETH

District Court, Fifth Judicial District: Hildreth

The Montana Supreme Court addressed similar issues in *Montana Coalition for Stream Access v. Hildreth*. The case arose from the conflicting views of Hildreth and recreationists as to floating rights on a stretch of the Beaverhead River running through his property. After hearing evidence of the extensive use of the Beaverhead for recreational purposes (fishing, floating, hunting), and for contemporary commercial uses (outfitters and trappers), the Fifth Judicial District Court found the Beaverhead to be navigable under both a pleasure-boat test and a commercial activity test. Therefore the

District Court concluded that members of the public have the right to use the waters and banks of the Beaverhead up to the ordinary high water mark, free from interference, and also the right to portage around any obstacle in the least intrusive manner.

The Montana Supreme Court: Hildreth

Hildreth appealed and the Montana Supreme Court affirmed the result of the lower court's decision while significantly modifying the court's conclusions of law. Drawing from the *Curran* decision, the Supreme Court emphasized that "the capability of use of the waters for recreational purposes determines whether the water can

be so used." There are no limitations in the Montana Constitutional provision that the state owns the water for the benefit of its people. The only possible limitation of use must arise from the characteristics of the waters themselves. No owner of property adjacent to state-owned water has the right to control the use of those waters as they flow through his property. The pleasure-boat test is not adopted in Montana as it is "unnecessary and improper to determine a specific test under which to find navigability for recreational use." Neither was there a need for the Fifth Judicial District Court to employ a commercial use test, as that federal test is used to determine navigability for title purposes, and not navigability for use. Also carried forward from *Curran* is a clear enunciation of the public's right to use the water and the bed and banks of the Beaverhead up to the ordinary high water mark and the right of portage around barriers in a manner that will avoid damage to the adjacent landowner's property. Again, too, the Supreme Court declared that the public had no right to enter upon or cross over private property to reach state-owned water held available for recreational

purposes.

As part of his appeal, Hildreth contended that the District Court should have determined title to the streambed of the Beaverhead as it ran through his property which he asserted belonged to him. The Supreme Court dismissed the contention, drawing again from *Curran* to re-emphasize that the question of title to the underlying streambed is immaterial in determining navigability for recreational use of state-owned waters. There is also consistency with *Curran* in the court's restatement of the holding that "under the Public Trust Doctrine and the 1972 Montana Constitution, any surface waters that are capable of recreational use may be so used by the public without regard to streambed ownership or navigability for nonrecreational purposes."

In *Curran*, the Montana Supreme Court dismissed a contention that property was being taken without compensation because the court found that Curran had no claims to the waters of the Dearborn, and hence there could be no taking. In *Hildreth*, a similar claim was dismissed because rights of public use of the waters of the Beaverhead had been determined, not title.

SUMMARY

In *Curran* and *Hildreth*, the Montana Supreme Court has added Montana to the roster of states recognizing broad public recreational rights to the use of state waters, without regard to findings of navigability and without regard for private ownership of streambeds. In reaching the two decisions, the Montana Supreme Court has relied on the 1972 Montana Constitution's declaration that all waters within the boundaries of the state are the property of the state for the use of its people and on the public trust doctrine. The Montana court thus has tied the public trust doctrine to the state's fundamental law, and made it applicable to all waters in the state capable of recreational use. Thus a doctrine, which has been linked traditionally to streambeds and to waters declared to be navigable under the federal test for title determination, must henceforth be considered when questions of public rights in Montana's waters arise, and in actions taken by the state affecting Montana waters, including water marketing.

The historical development of the public trust doctrine has produced guidelines for the range of the state's power to protect the public interest and the exercise of state powers over waters held in public trust.

As for the reach of state powers to protect the public interest under the public trust doctrine, an early United States Supreme Court decision held that the state "may

forbid all such acts as would render the public right less valuable, or destroy it altogether." The landmark United States Supreme Court decision in *Illinois Central Railroad v. Illinois* provided:

... the control of the state for the purposes of the trust can never be lost, except as to such parcels as are used in promoting the interests of the public therein, or can be disposed of without any substantial impairment of the public interest in the lands and water remaining. . . .⁶

It is clear that in applying the public trust doctrine to state surface waters capable of recreational use, the Montana Supreme Court has set the stage for both legislative deliberations and additional judicial decisions on issues addressed by the California Supreme Court in *National Audubon Society v. Superior Court of Alpine County*,⁷ including taking the public trust into account in the planning and allocation of water resources, and reconsidering allocation decisions on the basis of their effect on the public trust. Montana had already traveled a great distance in its statutory protections for streambeds and the water and fishery resources. In these matters, the effect of *Curran* and *Hildreth* is to link common law doctrine to the Montana Constitution as support for the actions of the legislature.

FOOTNOTES

1. No. 83-164 (Mont. May 15, 1984). Plaintiffs in addition to the Montana Coalition for Stream Access were the Montana Department of Fish, Wildlife and Parks and the Montana Department of State Lands. Amicus Curiae briefs were filed by Professor Albert Stone of the University of Montana School of Law, the National Wildlife Federation and the Montana Wildlife Federation, the Montana Stockgrowers Association, and the Montana Council of Trout Unlimited. Chief Justice Haswell delivered the opinion of the Court, joined by Justices Harrison, Shea, Morrison, Sheehy and Weber. Justice Gulbrandsen dissented.
2. Under federal law, each state acquired title to the bed and banks of navigable streams up to the high-water mark upon admission to the Union. While under Section 70-1-202, Montana Code Annotated, state ownership is asserted of all land below the water of a navigable stream, under Section 70-16-201, Montana — as a matter of state law — only owns the bed between low water marks, and the adjacent landowner owns the strip of land between high and low water marks.
3. 74 Mont. 587, 596, 241 Pac. 328 (1925).
4. No. 83-174 (Mont. June 21, 1984). In answering the complaint filed by the Montana Coalition for Stream Access, Hildreth filed a third-party complaint against the State of Montana, the Montana Department of State Lands, and the Montana Department of Fish, Wildlife and Parks. Amicus Curiae briefs were filed by Professor Albert Stone of the University of Montana School of Law, the National Wildlife Federation and the Montana Wildlife Federation, the Montana Council of Trout Unlimited, the Montana Farm Bureau Federation and the Wyoming Farm Bureau Federation, the Montana Stockgrowers Association and the Montana Woolgrowers Association. Chief Justice Haswell delivered the opinion of the Court, joined by Justices Shea, Weber, Morrison, and Sheehy. Justices Gulbrandsen and Harrison dissented.
5. *Smith v. Maryland*, 18 How. 71, 75 (155).
6. *Illinois Central Railroad Company v. Illinois*, 146 U.S. 387, 453 (1892).
7. *National Audubon Society v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983).

MONTANA STATE WATER PLAN

Many of the Lincoln seminar presenters mentioned Montana's need for a water plan that establishes the state's anticipated future uses of Missouri Basin water. A valid state water plan, they say, must go beyond the legal fiction of merely asserting the state's ownership of water; it must identify future water needs and provide

guidelines for allocating water for those needs. This plan will figure in any strategy to prevent downstream states from preempting Montana's claim to water. But does Montana's existing approach to a water plan meet these concerns?

The 1967 Water Resources Act authorized the

development of a state water plan (85-1-203, MCA). The law calls for the Department of Natural Resources and Conservation to inventory the state's water resources and to prepare a plan that sets forth a program for wise "conservation, development and utilization" of the water resources and that proposes the most effective means of using these resources for the benefit of the people. The department is expected to formulate and update elements of the plan, provide for review by the public, and submit the plan, or new parts of it, to each general session of the legislature. The legislature may offer input, but it does not systematically revise or approve the plan. Formal adoption of plan elements, updates or revisions are left to the Montana Board of Natural Resources and Conservation (BNRC).

Montana's initial water planning efforts were largely underwritten by federal agencies. Although the federal government has substantially withdrawn from the water development scene today, federal agencies still play a prominent role in many joint planning studies with state agencies.

The present state water plan falls short of the "comprehensive, coordinated multiple-use water resources plan" required by law. This is due in part to the changes in water planning priorities over the years and in part to the amount of work entailed in writing a statewide plan. The present state water plan is neither a single document nor exhaustively current in all of the dimensions that it is charged to address. Moreover, because the state's three major basins are affected by fundamentally different water issues, the attention given various elements of each basin's water plan is uneven. Thus, DNRC's approach is a cumulative process involving revisions as new issues arise in the various basins or sub-basins.

Some elements of water planning in Montana answer local needs: for example, concerns for shortages in some sub-basins or conflicts between instream and consumptive uses. Other elements have been prompted by pressure from outside: for example, a federal directive to improve records of water rights and water uses. Recently, the threat of claims from downstream states to water that Montana may wish to put to use in the future has stimulated interest in water planning.

The state has completed four basinwide studies and several detailed studies of special problems in targeted areas. The four basinwide studies are: the Flathead River Basin Study (1976); the Upper Missouri River Basin Level B Study (prepared with the Missouri River Basin States Association, 1976); the Clark Fork of the Columbia River Basin Cooperative Study, 1977; and the Yellowstone River Basin and Adjacent Coal Area Level B Study, 1976. The latter study was complemented by the Yellowstone Impact Study (1976), which assessed potential impacts of energy development on the basin's water resources. Only the Flathead study has been approved by the BNRC as a component of the state water plan.

The department's special studies include evaluations of water protection measures for the Missouri River Basin; the Milk River Basin water supply; documentation of existing water uses and recommendations for reservations in the Yellowstone Basin; negotiations by the Reserved Water Rights Commission; and transboundary water allocation issues with Canada and neighboring states.

In addition, the legislature has used interim studies to address major water issues, such as that conducted by the Select Committee on Water Marketing. These studies help form water policy and generally result in adjustments to state water policy and planning.

The state water planning process has received criticism because the plan has not been exposed to public hearing or submitted to each general session of the legislature. Sensitive to this criticism, the Department of Natural Resources and Conservation submitted to the 1985 Legislature a report on the state water plan that emphasizes the need to promote better legislative and public involvement and support for the state's water planning efforts.

Because the legislature has not been offered an ongoing opportunity for input on the state water plan, some critics believe that state water planning has become too closely tied to executive agencies. On the other hand, the department has prepared many studies that have resulted in recommendations to the legislature for new or amended water laws. By acting on these recommendations, supporters say, the legislature has provided indirect input on the state water plan.

The present state water plan admittedly does not adequately fit the needs of the state in regard to preserving future state options against downstream claimants of shared water. The department has suggested other areas that need attention:

- the state must completely inventory water claims and uses;
- the most certain way to assert a claim to water is to actually put it to use; this strategy is limited by lack of revenues for current water development;
- the reservation process, as in the case of the Yellowstone Basin, can be an effective tool for water allocation and should be applied to the Missouri Basin. The strength of the reservation depends upon putting the reserved water to its prescribed use;
- the state should prepare for negotiations among the Missouri Basin states by reasserting the validity of entitlements for upstream states under the Pick-Sloan program.

An effective state water plan also will require accurate information on how much water is available. This information is unlikely to be reliable, however, until completion of water rights adjudication. But other elements of the water plan cannot wait for the outcome. The state can make some predictions about future needs,

as it did in the Yellowstone River reservation process. It can also make reservations — for instream and consumptive uses — and commitments to certain water development that will help to establish the state's claim in all of its water basins.

The state plan does not have to be biased toward, or dominated by, water development plans. While developed water claims are easiest to defend, the most important consideration is that claims are viewed as part of a comprehensive plan in which reservations, instream flows, and water developments are considered. Some Lincoln seminar commentators noted that the plan would appear stronger if the state adopted the role of water marketer or if the state itself held title to the water in certain instances. A key difference in forming a comprehensive water plan, however, is to expand the efforts to pursue deliberately a plan for the use of the state's water resources.

The state water plan must not be vague if it is to help the state maximize control over the waters that arise within its borders. The most pragmatic approach is to put water to consumptive uses, since upstream and downstream states share the prior appropriation doctrine. But this kind of activity could provoke the politically more powerful downstream interests to use their clout. On the other hand, Montana should not develop a plan that reserves instream flows today with

the assumption that it can simply shift them to consumptive uses when it is convenient. Montana does not make all the decisions for the basin.

To have a good water plan, Montana must decide on its most important goal. Should Montana have a comprehensive water policy for the use of its own citizens — a plan that may keep downstream claimants from undermining the plan's purposes? Or should Montana keep downstream claimants from taking Montana water — a strategy that may allow some options for preferred uses that Montanans want in the future? The two goals have some common objectives. But assuming Montana cannot guarantee all the water it wants forever, the priority goal may determine who will get how much water for which use.

Is it possible to develop a single, coherent statement of water policy in Montana? It is difficult because people have substantially different reasons for promoting one: they want to use water or they want to conserve it; they want to export water for sale or they want to conserve instream flows. Yet, it is also difficult to receive adequate public comment and legislative input without a single package — a comprehensive, coordinated multiple use water resources plan — to examine. The current absence of such a plan is indicative of the challenge involved in this task.

WATER ADJUDICATION IN MONTANA

Adjudication of Pre-1973 Rights

The Water Use Act in 1973 established Montana's first effective water permit system. But the statute left

much uncertainty about the quantity and priority of individual pre-1973 "use rights." The act established a stream adjudication procedure to quantify these pre-1973 rights, and the first adjudication was initiated in the Powder River Basin.

The adjudication process proved extremely cumbersome and complicated, requiring DNRC personnel to walk waterways to discover unrecorded, unasserted, and unknown water rights. Additionally, the federal government sought to separate the adjudication of federal and Indian reserved rights from the state process on the basis that Montana did not have an effective adjudication underway in the state courts.

In response to these difficulties, the 1979 Legislature passed SB 76, which revised general stream and groundwater adjudication. The bill created a specialized water court with four divisions:

1. Yellowstone Basin;
2. Missouri River and its tributaries below the mouth of the Marias River;
3. Missouri River and its tributaries upstream from the Marias River to its various headwaters; and
4. waters west of the Continental Divide (the Clark Fork and Kootenai drainages).

Senate Bill 76 substituted a claims process for the DNRC field investigations. Water users asserting a claim to a pre-July 1, 1973 right were required to file that claim by April 30, 1982; over 200,000 claims were eventually filed.

Special water masters in each division consider the claims with the assistance of DNRC. The water judge assigned to the division then drafts preliminary decrees for individual basins or sub-basins outlining each recognized water right. After opportunities for objections to the preliminary decree, the water judge issues a final decree, which can be appealed to the Montana Supreme Court.

To date, three final decrees involving 10,716 claims have been entered. Chief Water Judge W.W. Lessley has predicted that the adjudication process will be completed by 1990. But a recent report done for DNRC differs, estimating it will take up to 20 years to complete the decrees.

withdrawn for a particular use; consequently the rights are frequently senior to many other rights on a stream. But the doctrine gives no clear guide for how much water was reserved to serve these tribal and federal lands. State governments as well as junior water rights holders face an unknown "wild card."

The reserved rights doctrine has also been extended to federal public lands reserved for a particular governmental purpose. If Congress creates a park, national forest, wildlife refuge, military base or other use of public land, the doctrine holds that the reservation of land also reserves water sufficient to accomplish congressional purposes. As with Indian water rights, the priority date for the federal water right is the date the public land was withdrawn from the public domain or reserved for a particular purpose. The water can be put to use at any time, and at that time it gains priority over intervening rights created under the state's system of prior appropriation.

Reserved water is limited to the amount necessary for the reservation's specific purposes as set forth by Congress, the president, or other executive official at the time the reservation was created. Thus, in *United States v. New Mexico*, which involved reserved water rights for a national forest created in 1899, the Supreme Court rejected the federal government's claims on water for wildlife, recreation, aesthetics, and stockwatering because the purposes specified in the Organic Act (which created the reservation) were limited to insuring a timber supply and protecting watersheds.

Federal and Indian Reserved Rights

Montana's Reserved Water Rights Compact Commission

Another goal of this general adjudication is to quantify federal and Indian reserved water rights. The reserved rights doctrine was developed by the courts to ensure that Indian lands and some public lands held by the federal government will have adequate water. The doctrine dates from the U.S. Supreme Court's 1908 decision in *Winters v. United States*.

The reserved rights doctrine has major implications for many western states. The priority of the federal or Indian water rights is established by the date the reservation was created or the date the public lands were

The quantification of water rights is important to the management and development of a state's water resources. Since the passage of the McCarran Amendment in 1952, the federal government has waived its sovereign immunity and has agreed to participate in stream adjudications in state or federal court. Indian water rights were exempt from such state adjudications until 1976, when the U.S. Supreme Court ruled that the McCarran Amendment also enables state courts to adjudicate Indian reserved rights as part of a

comprehensive statewide adjudication process.

Under its Water Use Act of 1973, Montana planned to adjudicate all water rights, including rights claimed by each of Montana's seven Indian reservations: Blackfeet, Crow, Flathead, Fort Belknap, Fort Peck, Northern Cheyenne, and Rocky Boy. But in 1975, the United States filed suit in federal court to take over the adjudication of reserved rights for the Northern Cheyenne and the Crow Indian reservations. By 1979, the United States had filed similar suits for the remaining five reservations.

When it revised the Water Use Act in 1979, the legislature created the Montana Reserved Water Rights Compact Commission to help resolve these reserved rights. This nine-member commission negotiates compacts with federal agencies and the Indian authorities. All compacts must be approved by the legislature, the governing body of the tribe (in cases of Indian rights), and the Congress. As long as negotiations for a compact on federal and Indian reserved rights are being pursued in good faith, all proceedings to adjudicate those reserved rights in the state's general adjudication process are suspended. If compact ratification has not been obtained by July 1987, the suspension will terminate. Federal and Indian claims

will have to be filed in the state adjudications within six months thereafter and the Compact Commission will cease to exist. Based on a U.S. Supreme Court decision and Montana's subsequent creation of a statewide adjudication procedure, the federal district court dismissed the seven cases that the federal government had brought on behalf of the Indian reservations.

The seven Montana tribes and those federal agencies claiming water rights within the state have been invited to negotiate with the commission. Negotiations have been undertaken with the Northern Cheyenne Tribe, the Sioux and Assiniboine Tribes of the Fort Peck Reservation, the Assiniboine and Gros Ventre Tribes of the Fort Belknap Reservation, the Crow Tribe, the Rocky Boy's Chippewa-Cree Tribe, the Turtle Mountain Chippewa Tribe of North Dakota, and the U.S. Departments of Agriculture, Interior, and Defense. The Flathead Tribes decided to terminate negotiations in May 1981, and the Blackfeet never agreed to enter.

A proposed Fort Peck-Montana water rights compact (SB 467) was ratified by the 1985 Legislature. It establishes the rights of the Assiniboine and Sioux tribes to water on, under, adjacent to, or otherwise appurtenant to the reservation.

IMPLICATIONS FOR MONTANA

Until quantified, Indian and federal reserved water rights create uncertainty for Montana's government and citizens. That uncertainty hampers the reservation process and creation and implementation of a coherent and reliable state water plan. Some Indian tribes, however, have resisted the adjudication process based on cultural beliefs against quantifying water or their inability to predict future water needs and discomfort in negotiating in a state process. Until determinations are made on the quantity of water reserved and the priority dates, all subordinate rights are clouded.

Outstanding reserved rights also hamper completion of the statewide adjudication of water rights. All nonreserved water claims were required to be filed by April 30, 1982 and the state water courts are expeditiously developing preliminary decrees. Judge

Lessley, the chief water judge, has vowed to complete all preliminary decrees by 1990. As long as reserved claimants are participating in negotiations with the Compact Commission, their claims need not be filed. Upon cessation of negotiations, or if a compact has not been approved by July 1, 1987, the reserved claims must be filed in the statewide adjudication process and treated similarly to all other claims.

Since the legislature extended the life of the Compact Commission, many preliminary decrees will remain subject to the quantification of prior reserved rights. At best, other negotiated agreements may be expeditiously reached and incorporated into the decrees. At worst, the negotiation process may become open-ended with the possibility of protracted negotiations, deadlock, and years of subsequent litigation.

MONTANA WATER RESOURCES RESEARCH CENTER

The Montana Water Resources Research Center was established in 1964. It is one of 54 such institutes established in the 50 states and four U.S. territories to aid a federal-state partnership in research and education about water resources. The Water Center is to:

- Conduct research to enhance the utilization, control, and management of water resources.
- Assist planning and regulatory agencies' policy and management decisions.
- Communicate research findings to water users and managers in a timely and usable fashion.
- Provide practical educational experiences for persons entering water resources professions.
- Educate the public on the use, protection and conservation of water resources.

The Water Center is administered through the vice-president for research at Montana State University. The center is led by a director at MSU, with campus coordinators designated at the University of Montana and Montana College of Mineral Science and Technology. Faculty from all units of the university system may participate in Water Center programs.

RESEARCH PROGRAMS

The Water Center's research program is directed toward state water agencies and other organizations that have water-related functions. Research priorities are set by an Advisory Committee composed of personnel from federal, state, and local water agencies, and representatives from industry, agriculture, and environmental organizations. Since its inception, the Water Center has sponsored approximately 150 research projects; reports from these projects are available from the Water Center. Water Center research projects have included:

Verification of Leachates in Western Montana Lakes conducted by Dr. Jack A. Stanford, University of Montana Biological Station. (Additional funding was provided by the Confederated Salish and Kootenai Tribes, Flathead Lakers, Inc., and private citizens.)

Septic tank-soil absorption systems serving lakeside homes and businesses are often suspected as the source of undesirable nutrients and other contaminants to lakes. Because of the variable nature of both groundwater flow and soil-seepage interactions, it is often impossible to determine the entry point of contamination from failing or improperly installed septic systems. This project investigated *in situ* fluorometry as a means of detecting septic leachate at the shoreline.

Effluent from an experimental drain field constructed from native soils was mixed with Flathead Lake water and a fluorometric "fingerprint" characteristic of the mixture was developed. Areas of the Flathead Lake shoreline in which heavy algal growth indicated the addition of nutrients were then tested with a fluorometer. Readings similar to those of the artificial mixture indicated that most of the problem areas were receiving effluent from septic systems.

The methodology tested in this study provides a quick and inexpensive method of verifying septic leakage into lakes. It should provide a useful new tool to state and local health officials and water quality managers.

Development and Implementation of a Procedure to Resolve Transboundary Water Issues conducted by Dr. Lauren McKinsey, Montana State University. (This project was part of a study funded through the 49th

Parallel Institute by several sponsors.)

International river basin issues affect Montana and its three neighboring Canadian provinces. Several federal and state agencies are involved, usually on an intermittent, ad hoc and reactive basis. Progress has been costly, time-consuming and not always satisfactory to U.S. interests. McKinsey explored an alternative strategy that offers better clarity, coordination and cohesion in a joint project to monitor river basin issues.

The research consisted of two phases. The first involved building a process for mediating transboundary water issues between Montana and the bordering provinces. The second phase tested the process on two critically important transboundary water issues: the Milk/St. Mary and Poplar River basins.

Potential Hydrologic Impacts of Proposed Bituminous Coal Mining on the North Fork of the Flathead River conducted by Wayne Van Voast, Montana College of Mineral Science and Technology. (This project was cosponsored by the Montana Bureau of Mines and Geology.)

Strip-mining of coal often produces adverse effects on both surface water and groundwater. The proposed Cabin Creek coal mine in Canada, just north of the Montana-British Columbia border, has caused considerable concern in Montana because of its potential impact on the North Fork of the Flathead River. Van Voast attempted to predict the impact of mining at the Cabin Creek site on water quality in the Flathead. He also reviewed the environmental impact statement for the mine site, particularly with regard to activities near the stream.

Analysis of coal samples from the area indicated their acid-neutralizing potential exceeded the acid-producing potential. Groundwater analysis identified coal seam water to be of the calcium-magnesium-bicarbonate type while the overburden contains water of the sodium-bicarbonate type.

The results suggest that acid mine drainage from the Cabin Creek mine should not be a problem. Mineralization of waters entering the North Fork could result in some degradation of water quality, as could sediment from soil disturbances. The extent of degradation will depend on mining practices and on retention facilities for water and other residual materials extracted from the mine.

Recent Center Water Research

1985

HYDROGEOLOGIC FIELD RECONNAISSANCE FOR SUITABLE HAZARDOUS-WASTE-DISPOSAL AREAS

Dr. Stephen G. Custer
Montana State University

AGRICULTURAL IRRIGATION AND HYDROPOWER GENERATION: THE INTERRELATED COSTS AND BENEFITS

Dr. Richard L. Brustkern
Montana State University

WATER IN MONTANA SOILS: DYNAMIC AND PSEUDO-STATIC INTERACTION

Dr. A. Hayden Ferguson
Dr. Gerald A. Nielsen
Montana State University

CHEMICAL REACTIONS CONTROLLING COPPER TRANSPORT

Dr. Gordon Pagenkopf
Montana State University

THE EFFECTS OF SEPTIC SYSTEMS ON SHALLOW GROUNDWATER

Dr. William W. Woessner
Margaret Ver Hey
University of Montana

OVERBURDEN SOIL PASTE ANALYSIS: A SOLUTION OR A PROBLEM

Dr. Frank N. Abercrombie
Montana College of Mineral Science and Technology

INFORMATION DISSEMINATION: SURFACE WATER INFORMATION CENTER

Dr. Howard Peavey
Montana State University

IRON IN MONTANA'S GROUNDWATER: HOW TO RECOGNIZE AND MANAGE THE PROBLEM

Joseph J. Donovan
Montana College of Mineral Science and Technology

1984

IDENTIFICATION OF PREGLACIAL AQUIFERS IN THE NORTHERN PLAINS AREA

Thomas W. Patton
Montana College of Mineral Science and Technology

COAGULATION OF COLD WATERS

Dr. A. Amirtharajah
Montana State University

AN ECONOMIC FRAMEWORK FOR MANAGEMENT AND MARKETING OF WATER

Dr. Robert Taylor
Dr. Bruce Beattie
Dr. Michael D. Frank
Montana State University

COPPER TRANSPORT IN THE UPPER CLARK FORK RIVER

Dr. Gordon K. Pagenkopf
Montana State University

HEAVY METALS IN RESERVOIR SEDIMENT

Dr. J. N. Moore
Dr. Carrie Johns
University of Montana

1983

BIOHYDROLOGY OF MOUNTAIN FLUVIAL SYSTEMS

Dr. Arnold J. Silverman
University of Montana

INTERACTION OF MINE TAILINGS PONDS AND GROUNDWATER

Dr. William W. Woessner
University of Montana

VERIFICATION OF SEPTIC TANK LEACHATES IN LAKES USING FIELD FLUOROMETRIC

Dr. Jack A. Stanford
University of Montana Biological Experiment Station

HYDROLOGIC IMPACTS OF BITUMINOUS COAL MINING IN ROUGH MOUNTAIN TERRAIN

Wayne Van Voast
Montana College of Mineral Science and Technology

RESOLVING TRANSBOUNDARY WATER ISSUES

Dr. Lauren McKinsey
Montana State University

INFORMATION DISSEMINATION: TECHNOLOGY TRANSFER

Dr. Howard S. Peavy
Montana State University

INFORMATION DISSEMINATION: SURFACE WATER INFORMATION CENTER

Dr. Howard S. Peavy
Montana State University

1982

ACID MINE DRAINAGE IN THE STOCKET-SAND COULEE COAL FIELD AREA

Joseph J. Donovan
Montana College of Mineral Science and Technology

NUTRIENT FLOW IN GROUND AND SURFACE WATER SYSTEMS

Dr. Jack A. Stanford
University of Montana Biological Station

EFFECTS OF URBANIZATION OF PHYSICAL HABITAT FOR TROUT

Dr. Ray White
Montana State University

ESTIMATING INSTREAM FLOW REQUIREMENTS FOR TROUT BY THE WETTED PERIMETER METHOD

Dr. Robert J. White
Montana State University

QUANTIFICATION OF IRRIGATION RETURN FLOWS BY TIME SERIES ANALYSIS

Dr. Richard L. Brustkern
Montana State University

ESTIMATING FLOW-DURATION CURVES FOR UNGAGED MOUNTAINOUS AND HIGH PLAINS STREAMS

Dr. Alfred B. Cunningham
Montana State University

CHEMISTRY OF MONTANA SNOW PRECIPITATION

Dr. Gordon K. Pagenkopf
Montana State University

MATCHING GRANT PROJECTS

IMPROVING TECHNIQUES FOR ESTIMATING THE VALUE OF WATER IN AGRICULTURE

Bruce R. Beattie
Montana State University

WATER RESOURCES MANAGEMENT SIMULATOR

Dr. Alfred B. Cunningham
Dr. John Amend
Montana State University

IMPACT OF ASH DEPOSITS ON MONTANA LAKES

Dr. Richard Juday, Dr. Edward Keller
University of Montana

FERTILIZATION OF ALPINE LAKES BY VOLCANIC ASH FALLOUT

Dr. Jack A. Stanford
University of Montana Biological Station

SNOW AVALANCHE MODELS ADAPTED TO MUDFLOWS

Dr. Theodore E. Lang
Dr. J. D. Dent
Montana State University

INFORMATION TRANSFER

The Water Center disseminates reports and research notes from water centers in 49 states and four territories, as well as from numerous state and federal agencies. Additionally, the Water Center sponsors public information and training programs, professional conferences and other activities that foster public discussions regarding the development, use and conservation of Montana's water.

An important part of the Water Center's information transfer program is the Surface Water Information Center. Because several state, federal and private agencies are involved in water data gathering activities, several data files exist. The Water Center coordinates existing surface water files and stores data not otherwise filed. This system provides ready access to all available surface water data.

SUMMARY

POLICY SUMMARY:

WHERE DO WE GO FROM HERE?

We face a major upheaval in western water law today. The causes have as much to do with changing values for water as they do with decisions made in Washington, D.C. Three of the major changes have been (1) to federalize, in law as well as in fact, our water resources;

(2) to apply economic principles to water use; and (3) to modify the prior appropriation doctrine so as to recognize other values of water. Each of these changes is at work throughout the West; each has been recently manifested in Montana.

CHANGES IN THE WEST

Federalizing Water Resources

Since the settlement of the American West, water law has been an enclave reserved to the states — protected

from federal intervention more by rhetoric and deference than by an honest reading of constitutional law. States have typically claimed the water resources within their boundaries “for the benefit of the people.” States have typically resisted water rights based on federal law or water management by federal agencies.

Yet, since the Reclamation Act of 1902, states have rarely been reluctant to accept federal assistance to develop water for irrigation, power, or flood control

purposes. States have rarely refused federal assistance in moving water around for domestic and industrial purposes as well. In accepting this assistance, the western states have made a lengthy factual admission of the national and interstate interest in water resources.

The U.S. Supreme Court's 1982 decision in *Sporhase v. Nebraska* was legal recognition of what we have actually admitted all along: water is vested with local, interstate, and national significance. Restraints on the interstate movement of water can be as destructive of the national interest as tariffs among the states in the 1700s were the downfall of the Articles of Confederation. In *Sporhase* the court implicitly reaffirmed that, even as to water, we have a federal system where the greatest good usually results when the wealth of the nation can be freely exchanged and shared.

The court substituted the necessity of balancing state and federal interests in the interstate movement of water for the myth of exclusive state control. Yet, the court has given us little guidance as to how that balance shall be struck. Only further litigation, like that waged between El Paso and New Mexico over groundwater, will make the balancing point clear.

development money and now requires substantial local cost-sharing for any project construction.

The second trend has been to charge for the water itself. Through the severe 1977-78 California drought, water pricing and public education programs brought impressive water savings. South Dakota Governor Janklow's sale of water to the ETSI consortium was the first dramatic example of how profitable a state's proprietary interest in water could be. A recent proposal in Southern California to pay farmers to undertake water conservation measures to free water for municipal use as a substitute for developing new supplies demonstrates the strength of economic incentives in solving resource shortages.

Modifying the Prior Appropriation Doctrine

Aridity created the need for the prior appropriation doctrine, a water management regime uniquely suited to and necessary for the development of the western states. The doctrine recognized the need to transport water out of streambeds and lake beds to service mining claims, irrigate farms, and support nearby communities. The doctrine also provided judicial recognition of the customary practices that had developed in the West: that appropriators are entitled to capture and convey water for beneficial uses (including hydroelectric power); and that appropriators who are first in time have seniority in right. Even in California, where early appropriators trespassed on federal land, the California Supreme Court held that "courts are bound to take notice of the political and social condition of the country which they judicially rule" (*Irwin v. Phillips*, 1855).

Changing conditions and values in the West today are modifying the prior appropriation doctrine. Instream flow requirements in most western states protect scenic, wildlife and aquatic values. The public trust doctrine has helped secure public access to coasts and waterways. Conflicts between holders of senior hydropower rights and farmers and ranchers who want to put water to consumptive use are challenging the notion of priority. The net effect of these changes is to recognize new values in water and to make water more available to some users. It leaves a question: how can we deal fairly with traditional water users whose reasonable expectations are disrupted by these changes?

Applying Economic Principles

Water has never been free in the West. Too many people have invested their money, their sweat — even their lives — in developing water resources. Yet, westerners have not paid a lot for their water. Until recently in most of the West, water could be appropriated without charge. Its delivery costs were paid in large measure by federal taxpayers. The costs of pollution were paid by other users or the general public. On a national level, major water development decisions were the result of the political process. On the local level, water allocation decisions were made on the basis of tradition or by courts or administrative agencies.

Two recent trends have made economics a more frequent part of water allocation and distribution. The first trend has been to require water users to pay more directly for water development. Starting with the Carter "hit list" of reclamation projects, there has been increased scrutiny of expensive federal water development projects. The 1982 Reclamation Reform Act requires users to pay back federal costs more quickly. With large federal deficits since 1980, the federal government has drastically reduced water

MONTANA'S SITUATION

Each of these three regional trends is reflected in Montana; each suggests a set of subsidiary issues. As a composite, these trends and related issues will form Montana's water policy agenda for the future. In fact, many of them have been addressed by the permanent legislative Water Policy Committee in its workplan for the 1985-86 biennium.

Federalizing Montana's Water Resources

The interstate (hence federal) importance of Montana's water is becoming more apparent. The *Sporhase* case has already had major impact on Montana's water policy. At the start of the 1985 legislative session, Montana had on the books two constitutionally suspect provisions: a prohibition against the exportation of water (although it had been suspended) and a ban on the use of water for coal slurry purposes. With the passage of House Bill 680, Montana replaced these prohibitions with other provisions that enunciate a policy balancing the local, regional, and national importance of Montana's water. These provisions include a water-leasing program, a strategy to provide the maximum constitutional protection to Montana's water resources, and an emphasis on fostering good communications with downstream Missouri River states.

The importance of these steps became apparent in August 1985 when South Dakota filed an action in the U.S. Supreme Court against the states of Nebraska, Iowa, and Missouri. The suit appears to be in retaliation for the roles these downstream states played in thwarting South Dakota's sale of water to the ETSI pipeline consortium. While the suit purports only to "quiet title" to the waters of Oahe Reservoir, it raises issues in which virtually all Missouri River Basin states have an interest.

The incident underscores the facts that tensions in the basin are mounting and the inevitable confrontation is approaching. Given this rapid acceleration of issues, Montana's next steps, both in "putting its house in order" and in providing leadership in the basin, become crucial. Some of these needed steps are discussed next for their interstate significance. However, they are also

necessary for good Montana water management — regardless of their interstate importance.

Water Adjudication

The fundamental requirement of Montana's interstate water strategy is the documentation of existing water uses. Commencing in 1973 (and modified in 1979), Montana required that new water uses receive a permit issued by the Department of Natural Resources and Conservation (DNRC). Because this new permit system could not work without data concerning pre-1973 uses, the DNRC started a statewide adjudication of pre-1973 water uses. This is a monumental undertaking, involving over 200,000 claims in all the water basins of the state. But, however, the timely and accurate completion of this adjudication will be indispensable both to sound water management and to Montana's ability to claim water for these uses in any interstate apportionment action.

In the last year, two legal challenges have been made to the adjudication process. The first challenge, filed in August 1984 (*Montana v. United States*), involves the legal sufficiency of the adjudication process to consider Indian water rights. The second challenge, filed in July 1985 (*Montana Department of Fish, Wildlife and Parks v. Water Court*) and being joined by other parties, questions the adequacy of administration of the adjudications by the Water Court.

The problems and issues identified by these suits raise important questions about the adjudication process. It is imperative that the Montana Supreme Court promptly resolve these cases so that any shortcomings can be addressed by the Water Court or, if necessary, by the legislature.

Water Development

Readily available water is critical to a productive Montana. Developments that use or store Montana

water are very important to future economic growth in our state. Moreover, water developments are an effective method — perhaps the most effective method — of establishing legal claims to water and defending against other states' claims.

The DNRC water development program has actively promoted water development in the state. In addition to technical assistance, the program offers grants and loans to state agencies, local governments, and private parties. How much this program maximizes its response to the needs of Montanans and to directives, however, needs to be studied.

Project selection is one subject that received attention by the 1985 Legislature. Under HB 947, DNRC must recognize the important role of agriculture in Montana's economy and must give particular attention to the needs of agriculture in its water development programs. In addition, the DNRC and the legislature, in analyzing proposals for project appropriations, are to give preference to proposals that promote the water reservation system, the development of the state water plan, and other state water programs recommended by the legislative Water Policy Committee.

Federal projects are also important to water development in Montana. Under the Pick-Sloan program, development of the Missouri River Basin is encouraged "as speedily as may be consistent with budgetary requirements." HB 680 recognizes federal funding possibilities by requiring DNRC to rank the projects it proposes for congressional authorization and funding, and to submit a report to the legislature and to the Water Policy Committee.

Although funds are limited, efforts must be undertaken to identify cost-effective, environmentally sound projects that can put water to work. The state must continue to secure federal funds and to appropriate its own funds for these priority projects. The state must also explore creative finance options with the private sector and with Indian tribes that also have an interest in developing water resources.

Water Reservation Program

If water cannot be presently developed, it perhaps can be reserved. Montana law allows the reservation of water in the present for preferred uses in the future. While reservations of water for agriculture, instream flows, and other uses have been established for the Yellowstone River Basin, the reservation process in the Missouri River Basin is just beginning with the drafting of detailed rules by DNRC staff.

The reservation process is important because it will help formalize future entitlements to water among

Montana water users and will provide a basis for Montana to assert claims for future water needs against the claims of downstream states. A verifiable reservation system is also important in negotiations to determine federal and Indian reserved water rights in the Missouri Basin.

The 1985 Legislature appropriated funds to commence the reservation process on the Missouri River; this program is an important element in Montana's interstate strategy. According to the provisions of HB 680, this process must be completed by 1989. Montana's policymakers also must ensure that adequate steps are being taken to perfect the Yellowstone River reservations already made.

State Water Plan

In a 1984 interstate water apportionment, *Colorado v. New Mexico*, the U.S. Supreme Court indicated that: "[I]t would be irresponsible use to apportion water to uses that have not been, at a minimum, carefully studied and objectively evaluated, not to mention decided upon.

[W]e find ourselves without adequate evidence to approve Colorado's proposed diversion. Colorado has not committed itself to any long-term use for which future benefits can be studied and predicted. [W]e have not asked for . . . precision.

We have only required that a State proposing a diversion conceive and implement some type of long-range planning and analysis of the diversion it proposes. Long-range planning and analysis will, we believe, reduce the uncertainties with which equitable apportionment judgments are made."

Through this judicial decision, state water planning was elevated to major significance. The adequacy of a state's water plan will henceforth be a major factor in determining the allocation of interstate waters.

Montana law requires that the DNRC inventory the water resources of the state and prepare a comprehensive, coordinated multiple-use water plan. The plan is to set out a program for conserving, developing and utilizing the state's water resources. The plan should also detail the most effective means of using these resources for the benefit of the people. The plan and subsequent revisions are to be submitted to a general session of the legislature and the Water Policy Committee.

The DNRC undertakes many water planning activities, but it is unclear how the many specific studies it conducts fit into a state water plan that will satisfy the Supreme Court's new standard. Although the

department submitted a report on the state's water planning process to the 1985 Legislature, the plan itself was not submitted — nor was it offered for public hearings as also required by the statute.

Montana's state water plan needs to be completed. It is no mere procedural nicety. It is an indispensable prerequisite for demonstrating, in any interstate apportionment action, that Montana has systematically and thoughtfully planned for its water future. To this end the DNRC has allocated additional resources for proceeding with the state water plan during the 1986-87 biennium.

Water Data and Research

Relevant water research and the collection of accessible water data are important for good management practices, for long-term policy formulation, and for supporting Montana's position in negotiations or litigation concerning interstate water allocation. While research and data collection are ongoing activities in state agencies and institutions, they are often not well directed to state policy objectives. They are often not easily accessible to water users or state decision makers.

House Bill 680 addressed these problems in two respects: (1) it directed DNRC, in conjunction with other state agencies and universities, to maintain an efficient, centralized water resources data system; and (2) it directs the Water Policy Committee to review water-related research completed by state agencies and institutions. With this impetus, water data gathering and management and water research must proceed with the goal of providing sufficient information to interested members of the public, the state's water managers, and those negotiators or litigators who protect Montana's interests in relation to other states.

Increasing Communication Among Missouri Basin States

Montana's executive branch agencies must take the lead in developing the appropriate intragovernmental

means to manage Missouri River Basin water resources. The Missouri Basin States Association (MBSA) provides a forum for discussion and negotiation among the state water management officials in the basin. The MBSA has two major projects to help resolve water management disputes without expensive litigation and with a solid informational base. These projects are the development of a water resources data management system and a conflict resolution process involving member states.

Yet, residents and state legislators in the basin must better understand the problems that produce tensions among the states and the perspectives of the other states. Legislators, in particular, must articulate the desires and interests of their citizens; must better understand the activities of the MBSA; and, as policymakers and holders of their states' purse strings, must participate in water management decisions affecting their states' future.

Several recent developments afford opportunities for educating and involving basin citizens and legislators. The Northern Lights Institute in Missoula is initiating an Upper Missouri Basin citizens' project to acquaint the public with the issues and to allow them to express their views. And as a step toward involving other basin legislators, Montana legislators discussed the possibilities of interstate activities during the August meeting of the National Conference of State Legislatures (NCSL). The possibilities include a symposium involving legislators and agency personnel from the basin states; an ongoing series of meetings among legislators; a regular newsletter; papers on selected topics; training sessions on conflict management; and a traveling presentation on Missouri River issues to be made in each of the state capitols. NCSL recently secured funding to proceed with this effort.

These and other approaches need to be tried in an effort to substitute mediation and conflict management for expensive and divisive litigation.

Applying Economic Principles to Montana's Water Allocation

Montana took a major step in 1985 in applying economics to water allocation with the institution of a state water leasing program. It allowed up to 50,000 acre-feet of stored water to be leased by the DNRC. In

certain instances — when interbasin transfers are contemplated or larger uses of water are proposed — legislative approval will be required.

The influence of economics on water management is also being felt. The need to manage water supplies to eliminate wasteful use of water is becoming recognized as fundamentally important to the economies of the arid western states. For example, Nebraska has developed water use efficiency plans and recommendations to achieve better use of its limited water supplies and to promote a stable and prosperous economy. This planning becomes especially important in times of drought, such as the one experienced by Montana in the summer of 1985.

Water Use Efficiency

Several western water authorities have discussed the need to modify existing prior appropriation laws to maximize the use of water resources. Their concerns apply to Montana. For example, one question is whether a decrease in water consumption associated with the use of a water conservation measure can result in a reduction in the water right. Another concern is whether increased water use efficiency would interfere with or enhance Montana's ability to secure a fair share of its water resources for future Montana water needs.

Montana decision-makers must identify legal, technical, and cultural barriers to water efficiency. Greater water efficiency might result from changes in existing administrative or statutory requirements, from economic incentives to promote efficient use, or from research and educational programs.

Drought Policy

Montana's record 1985 drought presented major problems for Montana citizens. Farmers and ranchers suffered as much as \$200 million in drought-related losses. Several cities had their water supplies interrupted. Some streams were seriously dewatered and their fisheries damaged. A major conflict between Indians of the Flathead Reservation and non-Indian irrigators was narrowly avoided by a creative settlement urged by the federal district judge hearing the case.

The state's drought response plan was developed as the drought was reaching severe conditions. The governor appointed a task force under the chairmanship

of the lieutenant governor, and a draft drought plan which had received little attention since 1977 was brought out mid-summer to guide state assessment and response.

If drought conditions persist or reoccur, it is important that the state be able to respond as effectively as possible. Water efficiency measures, such as those discussed in the preceding section, can help to reduce water demand. Yet drought-specific efforts must also be developed. While some state response measures were helpful in 1985, a more organized response system for both short-term and long-term droughts could maximize state assistance. Such a response requires advance analysis of available state resources and the manner in which they are made available to the public. Also, important questions need to be addressed concerning the ability to predict drought conditions, the duty of all water users to curtail water use, cooperation with federal agencies and tribes, and the proper focus for state drought response.

Modifying Montana's Prior Appropriation Doctrine

As it is in other western states, the traditional form of Montana's prior appropriation doctrine is undergoing change. Instream uses have been recognized as beneficial uses of water. The reservation system, varying from the normal requirement that water actually be put to use, allows water to be reserved for future use.

Two additional recent developments are worthy of discussion here. The first is the movement to secure public access to the surface waters of the state. The second development concerns growing tensions between holders of senior hydropower rights and those desirous of new, upstream consumptive uses.

Stream Access and the Public Trust Doctrine

Defining public access rights to the surface waters of the state has been an exceedingly controversial issue. In spring 1984, the Montana Supreme Court issued two opinions (*Montana Coalition for Stream Access v. Curran* and *Montana Coalition for Stream Access v. Hildreth*) that recognized the right of public access to all

surface waters of the state that are capable of recreational use. The basis of the court's decision was the state constitution and the public trust doctrine.

The issue of public access to streams and rivers was prominent during the 1985 legislative session. HB 265 passed by the legislature and signed by the governor, elaborates on the court's decisions and attempts to modify legislatively portions of those holdings.

There is ample indication that this legislation has not put the stream access issue to rest. A lawsuit has been filed in state district court by some landowners who assert that portions of the new law constitute an unconstitutional taking of private property. Numerous petitions have been filed under the provisions of HB 265 asking the Fish and Game Commission to declare certain streams unsuitable for public use. The potential need for legislation similar to HB 265 for the state's lakes remains unaddressed.

Hydropower Issues

Since the energy crisis of the 1970s, hydroelectric power has achieved new importance as an inexpensive and clean source of energy. The passage of the federal Public Utility Regulatory Policies Act (PURPA) in 1978 provided an incentive for the construction of new hydro capacity, primarily small-scale projects.

The new emphasis on hydro, however, has not been without its problems. The first issue relates to the licensing of small-scale hydro facilities by the Federal Energy Regulatory Commission (FERC). This responsibility is one of many borne by FERC, and the

backlog of applications has been tremendous. In addition, FERC has been accused of a lack of sensitivity to the concerns of many states, including Montana. Citizens and state agencies believe that FERC licensing decisions interfere with state water planning and do not adequately consider the environmental effects of new installations.

The second issue posed by this new emphasis on hydro is the competition between hydro rights and other water uses. In many basins, hydro rights held by federal agencies or private utilities are senior to most other users in the basin. As other consumptive rights become developed in a basin, there is the potential for interference with existing instream hydro rights. In many instances, these hydro rights have been subordinated (or made junior) to later consumptive rights by formal agreement or by the informal acquiescence of the hydro right holder. However, there is growing indication that hydro right holders are beginning to challenge the issuance of new permits that could diminish their rights. One could predict that these holders will also oppose reservations of water if they fear a diminution of their rights. The recent dispute between Idaho Power Company and upstream farmers and ranchers (the "Swan Falls" controversy) is one example of brewing conflict. Montana Power Company's challenge of new water permits upstream of Canyon Ferry Dam issued by DNRC is another example.

Montana, in cooperation with other western states, should consider presenting its hydro licensing problems to FERC, other federal agencies and Congress. Montana decision-makers should also investigate the relationship between existing instream hydropower rights and the state's ability to authorize increased consumptive water uses in the future. Such an investigation might identify solutions that allow the coexistence of existing hydro rights and new consumptive uses.

CONCLUSION

Western water policy over the last 100 years, based as it has been on the prior appropriation doctrine, state primacy, and water development, has served us well. Montana's water policy, particularly over the last decade, has been distinguished by innovative, forward-looking policies. Thus, Montana can be expected to adapt to the trends previously outlined much more readily than many other western states.

Yet, the pace of change in water law and policy will

press Montana's citizens and policymakers. They will have to address intelligently and courageously the questions outlined in this report. The statements and opinions for which we have provided a forum might raise some questions and suggest some answers, but the solutions depend on active, well-informed participation from across Montana. Our success in encouraging this will ensure a water policy sufficient to meet the needs of the next 100 years.

EQC ACTIVITIES

MEPA TASK FORCE

The 1971 Montana Legislature established MEPA, the Montana Environmental Policy Act (75-1-101, et seq., MCA), to require state agencies, industry, and individuals to consider the environmental effects of resource development. MEPA also directed the establishment of the Environmental Quality Council to research and review state regulations and policies affecting Montana's environment. A primary responsibility of EQC has been to oversee the implementation of MEPA.

Under MEPA, the EQC is responsible for reviewing the programs and activities of state agencies to insure that environmental goals are met. In November, 1984, EQC staff met with the representatives of five executive branch agencies to discuss implementation of MEPA. The meeting was the inaugural session for the MEPA Task Force, created at the suggestion of the Environmental Quality Council to improve state environmental review procedures.

The meeting focused on agency use of mitigating measures in environmental analyses — specifically, how proposed mitigating measures can influence a decision on whether or not to prepare an environmental impact statement (EIS). Agencies must prepare an EIS when a proposed state action will significantly affect the environment; in most cases a preliminary environmental review (PER) is first conducted to determine if the potential impacts pass the “significance” test, thus

requiring an EIS.

Recently, agencies have produced some PERs that have approached 100 pages and contained the detail of an EIS. These documents have relied heavily on proposed mitigating measures to rule that impacts will not be significant and that no EIS is required.

Reviewers have pointed out some potential problems with this approach. First, the agency rules establishing the PER do not require a public comment period (although agencies have at their own discretion provided considerable opportunity for public comment and hearings on the detailed PERs). Second, state law does not allow agencies to bill the permit applicant for costs associated with PER preparation, even though the detailed PERs can represent a significant commitment of staff and financial resources. Finally, questions have been raised on whether the long PERs are written as a means of avoiding the prescribed time limits and the study of alternative actions required in an EIS.

The task force decided to develop possible revisions in MEPA rules to make PERs focus on the anticipated environmental impacts and potential mitigating measures. Participants expressed an interest in making the PER a more useful document that will review the key issues without attempting to cover the universe of possible environmental impacts. Future meetings of the task force will review options for accomplishing this goal.

CLARK FORK STUDIES UPDATE

On April 30, 1984, Governor Ted Schwinden announced the initiation of a long-range, comprehensive study of the Clark Fork River Basin. The plan is a response to public concern for maintaining and improving water quality conditions in the river basin. Many interest groups, including the EQC, had encouraged the governor to support a comprehensive study of the Clark Fork River that would consider all of the major sources impacting the basin.

In June, 1985 the EQC sponsored a tour of the Clark Fork River Basin to provide a firsthand look at the

river's problems, to hear from technical specialists and citizens, and to help sort out the actors involved in what may be the most extensive and most expensive environmental cleanup in Montana's history. EQC members visited eight sites posing potential and actual threats to Clark Fork water quality. Mine tailings and tailings ponds from early mining activity along the upper Clark Fork are the greatest concern, but proposed waste discharges from the Champion International pulp and paper mill at Frenchtown have generated considerable interest in the past year.

FLATHEAD BASIN ISSUES

During the 1983-84 biennium the EQC worked closely with the Flathead Basin Commission on water quality issues in the Flathead Basin. EQC staff helped coordinate a basinwide water quality monitoring plan and assisted in efforts to increase public awareness of the commission's role in enhancing regional water quality.

EQC also submitted testimony to the International Joint Commission (IJC), which is investigating potential pollution of the Flathead River system from a proposed open pit coal mine in southeastern British Columbia. The IJC is a six-member U.S.-Canadian review board that oversees disputes over the 1909 Boundary Water Treaty, which states in part that "waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other."

State representative John Harp of Kalispell presented the EQC testimony, which focused on the Montana Legislature's commitment to environmental protection, as embodied in state water quality and mine reclamation statutes and in the establishment of the Flathead Basin Commission. The EQC testimony requested that the IJC consider this legislative history and the long-term benefits of mandating environmentally sound resource development.

The potential for mine-related water pollution of the

Flathead River system was brought to the attention of the IJC by the U.S. State Department at the urging of Montana's U.S. Senator Max Baucus. Several months of negotiations between U.S. and Canadian federal officials resulted in the mutual acceptance of the formal "terms of reference," which define the issues to be considered by the commission. Under the Flathead River Reference, the IJC must report on four issues:

- the present state of water quality and water quantity of the Flathead River at the border;
- current water uses in the Flathead River Basin;
- the status and significance of the affected fisheries; and
- effects on water quality that would result from construction, operation and reclamation of the proposed Cabin Creek coal mine.

At the conclusion of the study, the IJC will report on the facts of the reference and will present its conclusions and recommendations. Although IJC recommendations are not binding upon the two countries, any agreements reached at this level have a strong likelihood of being implemented.

The final IJC report is due in mid-1986. Observers are yet unsure whether this report will focus narrowly on the technical aspects of mine plans or more broadly on the appropriateness of coal mining in the North Fork.

MONTANA-ALBERTA LEGISLATIVE EXCHANGE

Transboundary water development in the Milk River Basin was discussed at a February 1984 meeting in Edmonton between a delegation of eight Montana legislators (including three EQC members) and members of the Alberta Legislative Assembly. The Milk rises along the east slope of the Rockies in Montana, flows northeast into Alberta, and returns to Montana near Havre. Montana irrigators in the Milk drainage face water shortages in four out of 10 years, and thus need increased reservoir capacity to store the spring runoff. At the same time, Alberta has treaty rights to use considerably more Milk River water than it presently does. If Alberta exercises those treaty rights, Montana farmers could face more severe water shortages.

At the Edmonton session, Montanans reviewed alternatives for Milk River development that are now under study by the Montana Department of Natural Resources and Conservation and the federal Bureau of Reclamation. These options include diverting water into the Milk from Tiber Reservoir on the Marias or from

the Missouri River at Virgelle.

A third option would involve a joint project with Alberta. Under this option, a dam would be constructed on the Milk in Alberta, and water releases would be managed to meet the needs of both Albertans and Montanans. Such a project could involve cost-sharing between the state and province, and would require considerable discussion and negotiation between the two governments.

A second installment of the Montana-Alberta legislative exchange was held in October in Great Falls. Major areas of discussion included the Milk River development and agricultural trade, marketing and research.

Transboundary water development and agricultural issues will receive future consideration under the auspices of the Montana-Western Canadian Provinces Boundary Advisory Committee, an interim legislative committee established by the 1985 Montana Legislature.

SMALL-SCALE HYDROPOWER

During the 1983-84 legislative interim, the Environmental Quality Council undertook a comprehensive review of the status of small-scale hydropower development in Montana. This research, already discussed in this report, provided a background on the environmental issues and regulatory framework of the small hydro industry.

The council selected this study topic when small-scale hydro appeared to be on the verge of rapid development in Montana. A review of key policy issues prior to the anticipated "hydro boom" was intended to help resolve the concerns of the public and developers so that Montanans could benefit from small hydro development without undue environmental consequences.

In researching small hydro, the Environmental Quality Council worked with the Department of Natural Resources and Conservation, the Department of Fish, Wildlife and Parks, and the Montana Small Hydro Association. One outgrowth of these efforts was SB 272, which passed in 1985, making private developers

eligible to lease state-owned dams for hydropower development. This bill, introduced at the request of DNRC, increases the likelihood that existing state dams will be retrofitted for electricity production. Additional interagency discussions focused on hydropower water rights and on the requirements for bypass (instream) flows to protect fisheries below hydro diversions. EQC also monitored state environmental reviews of proposed small hydro projects and participated in a regional small-scale hydropower symposium in Portland, Oregon, in 1984.

EQC will continue to monitor a number of unresolved hydropower policy issues, including questions of state-federal jurisdiction, the relationship of upstream water rights to downstream dams, the avoided-cost rate paid by utilities to small power producers, and the Northwest Rivers Study, a regional effort of the Northwest Power Planning Council to determine which streams can be developed without adverse environmental impacts.

HAZARDOUS MATERIALS MANAGEMENT

The Toxic Substances Subcommittee of the Environmental Quality Council thoroughly reviewed Montana's hazardous waste management program, administered by the Department of Health and Environmental Sciences. Discussion centered on the impacts of recent federal legislation on Montana businesses and the need for the state to respond with appropriate programs.

Of primary interest to the subcommittee was the management of small quantities of hazardous wastes. Amendments to the federal Resource Conservation and Recovery Act in 1984 brought businesses generating more than 220 pounds of hazardous waste per month under federal regulations. At the same time, municipal landfills in Montana have expressed growing reluctance to accept hazardous wastes because of potential problems with groundwater contamination and resultant liability.

The combination of these two factors has increased the pressure on small businesses to find economical ways to dispose of their hazardous wastes. State officials are concerned that illegal dumping of hazardous wastes in the environment may occur unless reasonably priced disposal alternatives are developed.

As a result of these considerations, the 1985 Legislature authorized DHES to spend up to \$800,000 from the Resource Indemnity Trust Fund to develop and operate a hazardous waste collection and transfer system. EQC members strongly supported this program, and promoted other successful legislative initiatives to strengthen the state hazardous waste management program.

The EQC Toxic Substances Subcommittee also considered legislative options for providing employees and the public with information on the hazards of workplace chemicals. These subcommittee deliberations were instrumental in the ultimate passage of the "Employee and Community Hazardous Chemical Information Act," otherwise known as the right-to-know law, which was enacted by the 1985 Legislature.

The subcommittee participated with the Montana Department of Agriculture and the Montana Weed Control Association in an Interagency Weed Task Force. The task force developed legislation to revise state weed control statutes and to increase funding for weed control programs. This effort was in response to growing public awareness of the serious economic and environmental threat posed by the rapid spread of exotic weeds on Montana rangeland and cropland.

The 1985 Legislature enacted most of the recommendations of the interagency task force. Significant revisions in the county weed law now encourage long-range planning and interagency coordination in local weed control programs. A trust fund, funded from the state Resource Indemnity Trust Fund and through a tax on herbicides, will support the effective regional weed management programs now being undertaken across Montana. The legislature also funded a new state weed coordinator position in the agriculture department. This position will be crucial to coordinating the various local weed control efforts and disseminating up-to-date information on weed control research and financial support options.

GROUNDWATER ACTIVITIES

The Environmental Quality Council addressed several groundwater management questions by its participation in the Groundwater Advisory Council, which was established by Governor Schwinden upon the EQC's recommendation. The Advisory Council examined several areas, including aquifer depletion, groundwater quality, water well drilling standards, and groundwater information needs. The council's recommendations are summarized in this report in Chapter I.

Of specific interest to the EQC is the problem of leaking underground storage tanks, which has received state and national attention recently. It is estimated that about 100,000 of at least 2,000,000 underground storage

tanks in the nation currently leak and pose threats to underlying groundwater. Moreover, an additional 350,000 tanks are expected to begin leaking during the next five years. In Montana, the increasing severity of this problem is already being documented. Over 40 cases of groundwater contamination caused by leaking tanks have been detected in the last two years.

Strategies for handling the leaking underground storage tank problem were addressed nationally by the passage of amendments to the Resource Conservation and Recovery Act in October, 1984. This legislation requires the Environmental Protection Agency to adopt regulations for both existing and new underground

storage tanks. For existing tanks, the regulations will include requirements for monitoring, recordkeeping and reporting, corrective action, closure, and financial responsibility. For new tanks, the requirements address design, installation, release detection, and compatibility standards. A notification process whereby all underground tanks will be registered by the states, including tanks abandoned within the last ten years, is also required.

The Environmental Quality Council made two recommendations relating to underground storage tanks. First, it endorsed a Water Quality Protection Fund proposed by the Department of Health and Environmental Sciences (DHES) to assist citizens who are victims of spills that contaminate surface or groundwater. This fund was designed to enable the department to investigate spills "...to determine the extent of the contaminated area, the source of the pollutant and, if necessary, make arrangements for an alternate water supply for affected parties." The department would also attempt to determine responsible

parties, thereby enabling transfer of cleanup costs to these persons. This recommendation was implemented by legislation authorizing a contingency fund to be used for a variety of environmental problems. The fund, administered by the governor, is financed by interest on the Resource Indemnity Trust Fund.

Although the EPA is the lead agency in administering the federal underground storage tank program, it may transfer program administration to the states. The EQC strongly endorsed eventual state administration of the underground storage tank program, noting the desirability of tailoring the program to meet the state's needs. In addition, the EQC requested that the DHES evaluate the resources that are available and that will be needed to administer the program. Appropriate legislation and funding for developing the regulatory program was passed by the 1985 Legislature. Initial state involvement will include an inventory of underground storage tanks according to the federal notification program and adoption of rules to implement the federal requirements.

SUBDIVISIONS

Subdivision growth and its potential effect on Montana's environment remain one of the more controversial environmental issues. The parceling of land and subsequent development reported in the 1984 EQC Annual Report continues. Many of Montana's 56 counties struggle with the problems of subdivision.

Incidents of lots eluding review, inadequate water supplies, and groundwater contamination are reported with increasing frequency. Budgetary and political constraints facing state and local subdivision reviewers have contributed to the problem. Exemptions allowed by the Subdivision and Platting Act also frustrate the review process. A single 20-acre lot may not be considered a problem for soil percolation and water supply, but if an original lot is split in smaller parcels through the occasional sale and family transfer exemptions, water quality problems may surface.

To identify both individual county problems and general concerns throughout the state, the EQC conducted a survey of Montana's 56 counties. Responses to the survey indicated intense concern about several aspects of subdivision review including: Subdivision and Platting Act exemptions; lack of enforcement capability at the state and local level; lack of adequate training at the local level for major subdivision review; slow turn-around time in the state office for plat approvals; and inability of both state and local authorities to limit the cumulative effects of subdivision growth on water quality.

The EQC has worked with state and local reviewers in

the last biennium and during the 1985 Legislature. The EQC staff cooperated with the DHES Water Quality Bureau in supporting successful legislation that enables the Subdivision Review Section to maintain a qualified core staff, increases local review enforcement authority, and permits counties to adopt rules providing more autonomy in subdivision review.

This legislation should improve subdivision review in several areas. An expanded staff in the Water Quality Bureau's Review Section will help expedite state approval of applications for lifting of sanitary restrictions and increase state and local interaction in the review process. Counties will also have the authority to impose civil penalties for infractions of the subdivision laws and rules, eliminating their dependence on county attorneys for enforcement.

These revised statutes allow each county to address specific problems in its own fashion, provided its actions do not conflict with state and federal guidelines.

Resolution of remaining subdivision problems will require a concerted effort on several fronts. Greater commitment of increasingly limited state and local funds is needed. Statutory revision might be necessary. More baseline data on surface water and groundwater could help evaluate the impacts of subdivision growth.

The EQC will work to resolve these concerns about subdivisions during the interim by consulting with subdivision developers, interested individuals, and state and local review authorities. Public involvement will be an important element of the study.

HARD ROCK MINING IMPACT ACT

Amendments to the Hard Rock Mining Impact Act were considered by the EQC Natural Resources Oversight Subcommittee. The subcommittee examined four problem areas in the act, and attempted to mediate an agreement among interested parties to resolve these problems.

The areas under discussion were: the definition of "local government unit"; the criteria for determining if a mineral development is a "large-scale mineral development"; the provision for repayment of prepaid taxes; and the developer's commitment to pay increased costs of local government.

HB 912, the product of these EQC discussions, was

passed by the 1985 Legislature. The legislation clarifies those governmental units that qualify as a local government unit. It also simplifies the test for large-scale mineral development, those where the payrolls of the mineral developer and contractors average 75 or more employees for six consecutive months.

The legislation also specifies the Department of State Lands' role in determining the large-scale mineral development status of a mine and provides that repayment of prepaid taxes shall be undertaken as specified in the impact plan. These and other provisions of HB 912 are designed to promote improved relations between local governments and mineral developers under the Hard Rock Mining Impact Act.

RENEWABLE ENERGY PROGRAM

In 1981, the Montana Legislature directed the EQC to study how the Department of Natural Resources and Conservation was implementing the Renewable Energy Grants and Loans program, now known as the Renewable Energy and Conservation Program (RECP). The EQC issued its first oversight report in 1982, detailing the history of the program, concerns raised by the legislature, and recommended improvements.

Since that report, the 1983 Legislature amended the law to allow grants and loans for energy conservation under the program, and to allow private ownership of research results. The DNRC also started or completed several projects that will affect RECP:

- the Sustainable Energy Assessment (SEA) project explored the best ways to spend program funds in 10 alternative energy areas, including geothermal, biofuels, wind and small-scale hydropower. The SEA project also signalled a DNRC trend of soliciting proposals for specific project areas, instead of relying solely on unsolicited proposals.
- the DNRC is establishing a more active public information thrust to RECP, including a marketing study, a report library, and cooperative proposal

development between the department and the public.

- the DNRC is cooperating with the Bonneville Power Administration and the Northwest Power Planning Council in a project to construct 100 super-insulated homes in western Montana. The project, the Residential Standards Demonstration Program, will test the costs and benefits of these energy-efficient homes and will acquaint Montana builders with super-insulating techniques. The DNRC is contracting with the National Center for Appropriate Technology for a similar project in eastern Montana.

The EQC made a number of recommendations in its report to the 1985 Legislature. One of the most important was for a formal relationship between RECP and the banking community, which EQC termed "imperative for the success of the loan program." Another recommendation called for further strengthening of public involvement in the program. Finally, EQC repeated its 1982 recommendation that DNRC prepare and disseminate preliminary environmental reviews (PERs) of its projects under the program.

MAJOR FACILITY SITING ACT RULES

The Energy Division of the Department of Natural Resources and Conservation recently revised its administrative rules for implementing the Major Facility Siting Act (MFSA). The EQC contracted with John C. Orth, former DNRC Director, to monitor these activities.

In addition to implementing changes made in the MFSA in the 1979, 1981, and 1983 legislative sessions, the department sought to simplify the rules and, where possible, establish quantitative standards for the environmental factors that must be considered under the act. Incorporation of specific standards were assigned to ensure a fair and uniform evaluation of the environmental impacts of proposed facilities.

Orth noted improvements in the treatment and definition of the "need" determination, the delineation of requirements for applications and long-range plans, and the decision standards and methodology that the

Board of Natural Resources and Conservation uses in its certification process. Areas that could be further developed include providing more quantitative criteria for addressing environmental factors and protecting confidential business information. He also suggested additional rules for applying the alternative siting and baseline data requirements to wind, geothermal, and hydroelectric technologies; for retrofitting existing plants to achieve greater efficiency through innovative technologies; and for guiding the post-certification monitoring and review of projects.

Because both the rules and the act are lengthy and complex, the EQC issued a guide to the act. The guide is targeted for legislators who wish to gain familiarity with the act's provisions and its administration. It contains sections on the act's history, facilities covered by the act, procedures under the act, application requirements and decision standards. Copies are available from EQC.

PERMIT INDEX

In a cooperative effort, the staff from EQC and the Department of Health and Environmental Sciences updated the **Montana Index of Environmental Permits**. The Permit Index represents an effort by the two agencies to develop a comprehensive list of permits and licenses that must be obtained in order to engage in activities having potential impact on the Montana

environment. The document assists developers in identifying and complying with applicable permit requirements. It contains changes in permit requirements mandated by the 1983 Legislature and by revision of administrative rules of the regulatory agencies.

NATURAL RESOURCE DATA SYSTEM ADVISORY COMMITTEE

As a member of the Natural Resource Data System Advisory Committee, the Environmental Quality Council was instrumental in establishing the Natural Resource Information System and Montana Natural Heritage Program adopted by the 1985 Legislature. The programs are intended to make reliable information about Montana natural resources readily available to state agencies or individuals.

The Natural Resource Information System will provide a catalog of natural resource data available throughout the state. The Natural Heritage Program will supplement this material with research on plants, animals, and natural features that are unique or rare in Montana. Surveys of sources outside state government along with field studies will provide this information. The State Library will administer both programs.

DOCUMENTS SUBMITTED UNDER MEPA, 1984-1985

	1985		1984		TOTAL	
	PER	EIS	PER	EIS	PER	EIS
Health and Environmental Sciences	258	3	177		435	3
Highways		1	15	2	15	3
State Lands	15	5	14	1	29	6
Fish, Wildlife and Parks	7	3	11		18	3
Natural Resources and Conservation		2	1	2	1	4
Commerce	11		9		20	
Agriculture				1		1
TOTAL	291	14	227	6	518	20

MONTANA ENVIRONMENTAL POLICY ACT

Part 1

General Provisions

75-1-101. Short title. This chapter may be cited as the "Montana Environmental Policy Act".

History: En. Sec. 1, Ch. 238, L. 1971; R.C.M. 1947, 69-6501.

Cross-References

State policy of consistency and continuity in the adoption and application of environmental rules, 90-1-101.

75-1-102. Purpose. The purpose of this chapter is to declare a state policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the state, and to establish an environmental quality council.

History: En. Sec. 2, Ch. 238, L. 1971; R.C.M. 1947, 69-6502.

75-1-103. Policy. (1) The legislature, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances, and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the state of Montana, in cooperation with the federal government and local governments and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can coexist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Montanans.

(2) In order to carry out the policy set forth in this chapter, it is the continuing responsibility of the state of Montana to use all practicable means consistent with other essential considerations of state policy to improve and coordinate state plans, functions, programs, and resources to the end that the state may:

(a) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(b) assure for all Montanans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

(c) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(d) preserve important historic, cultural, and natural aspects of our unique heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice;

(e) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(f) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(3) The legislature recognizes that each person shall be entitled to a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

History: En. Sec. 3, Ch. 238, L. 1971; R.C.M. 1947, 69-6503.

Cross-References

Right to clean and healthful environment,
Art. II, sec. 3, Mont. Const.

Duty to maintain a clean and healthful environment, Art. IX, sec. 1, Mont. Const.

Comments of historic preservation officer,
22-3-433.

Renewable resource development, Title 90,
ch. 2.

75-1-104. Specific statutory obligations unimpaired. Nothing in 75-1-103 or 75-1-201 shall in any way affect the specific statutory obligations of any agency of the state to:

(1) comply with criteria or standards of environmental quality;

(2) coordinate or consult with any other state or federal agency; or

(3) act or refrain from acting contingent upon the recommendations or certification of any other state or federal agency.

History: En. Sec. 6, Ch. 238, L. 1971; R.C.M. 1947, 69-6506.

75-1-105. Policies and goals supplementary. The policies and goals set forth in this chapter are supplementary to those set forth in existing authorizations of all boards, commissions, and agencies of the state.

History: En. Sec. 7, Ch. 238, L. 1971; R.C.M. 1947, 69-6507.

Part 2

Environmental Impact Statements

75-1-201. General directions — environmental impact statements. (1) The legislature authorizes and directs that, to the fullest extent possible:

(a) the policies, regulations, and laws of the state shall be interpreted and administered in accordance with the policies set forth in this chapter;

(b) all agencies of the state, except as provided in subsection (2), shall:

(i) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(ii) identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(iii) include in every recommendation or report on proposals for projects, programs, legislation, and other major actions of state government significantly affecting the quality of the human environment, a detailed statement on:

(A) the environmental impact of the proposed action;
(B) any adverse environmental effects which cannot be avoided should the proposal be implemented;

(C) alternatives to the proposed action;

(D) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and

(E) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented;

(iv) study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(v) recognize the national and long-range character of environmental problems and, where consistent with the policies of the state, lend appropriate support to initiatives, resolutions, and programs designed to maximize national cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(vi) make available to counties, municipalities, institutions, and individuals advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(vii) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(viii) assist the environmental quality council established by 5-16-101; and

(c) prior to making any detailed statement as provided in subsection (1)(b)(iii), the responsible state official shall consult with and obtain the comments of any state agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate state, federal, and local agencies which are authorized to develop and enforce environmental standards shall be made available to the governor, the environmental quality council, and the public and shall accompany the proposal through the existing agency review processes.

(2) The department of public service regulation, in the exercise of its regulatory authority over rates and charges of railroads, motor carriers, and public utilities, is exempt from the provisions of this chapter.

History: En. Sec. 4, Ch. 238, L. 1971; R.C.M. 1947, 69-6504; amd. Sec. 1, Ch. 391, L. 1979.

Cross-References

Citizens' right to participate satisfied if environmental impact statement filed, 2-3-104.

Statement to contain information regarding heritage properties and paleontological remains, 22-3-433.

Statement under lakeshore protection provisions required, 75-7-213.

Impact statement for facility siting, 75-20-211.

Energy emergency provisions — exclusion, 90-4-310.

75-1-202. Agency rules to prescribe fees. Each agency of state government charged with the responsibility of issuing a lease, permit, contract, license, or certificate under any provision of state law may adopt rules prescribing fees which shall be paid by a person, corporation, partnership, firm, association, or other private entity when an application for a lease, permit,

contract, license, or certificate will require an agency to compile an environmental impact statement as prescribed by 75-1-201. An agency must determine within 30 days after a completed application is filed whether it will be necessary to compile an environmental impact statement and assess a fee as prescribed by this part. The fee assessed under this part shall be used only to gather data and information necessary to compile an environmental impact statement as defined in this chapter. No fee may be assessed if an agency intends only to file a negative declaration stating that the proposed project will not have a significant impact on the human environment.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(1).

Cross-References

Fees authorized for environmental review of subdivision plats, 76-4-105.

Fees in connection with environmental impact statement required before issuing permits to appropriate water, 85-2-124.

75-1-203. Fee schedule — maximums. (1) In prescribing fees to be assessed against applicants for a lease, permit, contract, license, or certificate as specified in 75-1-202, an agency may adopt a fee schedule which may be adjusted depending upon the size and complexity of the proposed project. No fee may be assessed unless the application for a lease, permit, contract, license, or certificate will result in the agency incurring expenses in excess of \$2,500 to compile an environmental impact statement.

(2) The maximum fee that may be imposed by an agency shall not exceed 2% of any estimated cost up to \$1 million, plus 1% of any estimated cost over \$1 million and up to \$20 million, plus $\frac{1}{2}$ of 1% of any estimated cost over \$20 million and up to \$100 million, plus $\frac{1}{4}$ of 1% of any estimated cost over \$100 million and up to \$300 million, plus $\frac{1}{8}$ of 1% of any estimated cost in excess of \$300 million.

(3) If an application consists of two or more facilities, the filing fee shall be based on the total estimated cost of the combined facilities. The estimated cost shall be determined by the agency and the applicant at the time the application is filed.

(4) Each agency shall review and revise its rules imposing fees as authorized by this part at least every 2 years. Furthermore, each agency shall provide the legislature with a complete report on the fees collected prior to the time that a request for an appropriation is made to the legislature.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(2), (7).

75-1-204. Application of administrative procedure act. In adopting rules prescribing fees as authorized by this part, an agency shall comply with the provisions of the Montana Administrative Procedure Act.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(4).

Cross-References

Montana Administrative Procedure Act — adoption and publication of rules, Title 2, ch. 4, part 3.

75-1-205. Use of fees. All fees collected under this part shall be deposited in the state special revenue fund as provided in 17-2-102. All fees paid pursuant to this part shall be used as herein provided. Upon completion

of the necessary work, each agency will make an accounting to the applicant of the funds expended and refund all unexpended funds without interest.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(5); amd. Sec. 1, Ch. 277, L. 1983.

Compiler's Comments

1983 Amendment: Substituted reference to state special revenue fund for reference to earmarked revenue fund.

75-1-206. Multiple applications or combined facility. In cases where a combined facility proposed by an applicant requires action by more than one agency or multiple applications for the same facility, the governor shall designate a lead agency to collect one fee pursuant to this part, to coordinate the preparation of information required for all environmental impact statements which may be required, and to allocate and disburse the necessary funds to the other agencies which require funds for the completion of the necessary work.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(6).

75-1-207. Major facility siting applications excepted. No fee as prescribed by this part may be assessed against any person, corporation, partnership, firm, association, or other private entity filing an application for a certificate under the provisions of the Montana Major Facility Siting Act, chapter 20 of this title.

History: En. 69-6518 by Sec. 1, Ch. 329, L. 1975; R.C.M. 1947, 69-6518(3).

Part 3

Environmental Quality Council

75-1-301. Definition of council. In this part "council" means the environmental quality council provided for in 5-16-101.

History: En. by Code Commissioner, 1979.

Cross-References
Qualifications, 5-16-102.

Term of membership, 5-16-103.
Officers, 5-16-105.

75-1-302. Meetings. The council may determine the time and place of its meetings but shall meet at least once each quarter. Each member of the council is entitled to receive compensation and expenses as provided in 5-2-302. Members who are full-time salaried officers or employees of this state may not be compensated for their service as members but shall be reimbursed for their expenses.

History: En. Sec. 10, Ch. 238, L. 1971; amd. Sec. 6, Ch. 103, L. 1977; R.C.M. 1947, 69-6510.

75-1-303 through 75-1-310 reserved.

75-1-311. Examination of records of government agencies. The council shall have the authority to investigate, examine, and inspect all records, books, and files of any department, agency, commission, board, or institution of the state of Montana.

History: En. Sec. 15, Ch. 238, L. 1971; R.C.M. 1947, 69-6515.

75-1-312. Hearings — council subpoena power — contempt proceedings. In the discharge of its duties the council shall have authority to hold hearings, administer oaths, issue subpoenas, compel the attendance of witnesses and the production of any papers, books, accounts, documents, and testimony, and to cause depositions of witnesses to be taken in the manner prescribed by law for taking depositions in civil actions in the district court. In case of disobedience on the part of any person to comply with any subpoena issued on behalf of the council or any committee thereof or of the refusal of any witness to testify on any matters regarding which he may be lawfully interrogated, it shall be the duty of the district court of any county or the judge thereof, on application of the council, to compel obedience by proceedings for contempt as in the case of disobedience of the requirements of a subpoena issued from such court on a refusal to testify therein.

History: En. Sec. 16, Ch. 238, L. 1971; R.C.M. 1947, 69-6516.

Cross-References

Warrant of attachment or commitment for contempt, 3-1-513.

Depositions upon oral examinations, Rules 30(a) through 30(g), 31(a) through 31(c), M.R.Civ.P. (see Title 25, ch. 20).

Subpoena — disobedience, 26-2-104 through 26-2-107.

Criminal contempt, 45-7-309.

75-1-313. Consultation with other groups — utilization of services. In exercising its powers, functions, and duties under this chapter, the council shall:

(1) consult with such representatives of science, industry, agriculture, labor, conservation organizations, educational institutions, local governments, and other groups as it deems advisable; and

(2) utilize, to the fullest extent possible, the services, facilities, and information (including statistical information) of public and private agencies and organizations and individuals in order that duplication of effort and expense may be avoided, thus assuring that the council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

History: En. Sec. 17, Ch. 238, L. 1971; R.C.M. 1947, 69-6517.

75-1-314 through 75-1-320 reserved.

75-1-321. Appointment and qualifications of executive director. The council shall appoint the executive director and set his salary. The executive director shall hold a degree from an accredited college or university with a major in one of the several environmental sciences and shall have at least 3 years of responsible experience in the field of environmental management. He shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the state government in the light of the policy set forth in 75-1-103; to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the state; and to formulate and recommend state policies to promote the improvement of the quality of the environment.

History: En. Sec. 11, Ch. 238, L. 1971; R.C.M. 1947, 69-6511.

75-1-322. Term and removal of executive director. The executive director is solely responsible to the council. He shall hold office for a term of 2 years beginning with July 1 of each odd-numbered year. The council may remove him for misfeasance, malfeasance, or nonfeasance in office at any time after notice and hearing.

History: En. Sec. 13, Ch. 238, L. 1971; R.C.M. 1947, 69-6513.

Cross-References

Official misconduct, 45-7 401.

Notice of removal to officer authorized to replace, 2-16-503.

75-1-323. Appointment of employees. The executive director, subject to the approval of the council, may appoint whatever employees are necessary to carry out the provisions of this chapter, within the limitations of legislative appropriations.

History: En. Sec. 12, Ch. 238, L. 1971; R.C.M. 1947, 69-6512.

75-1-324. Duties of executive director and staff. It shall be the duty and function of the executive director and his staff to:

(1) gather timely and authoritative information concerning the conditions and trends in the quality of the environment, both current and prospective, analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering or are likely to interfere with the achievement of the policy set forth in 75-1-103, and compile and submit to the governor and the legislature studies relating to such conditions and trends;

(2) review and appraise the various programs and activities of the state agencies, in the light of the policy set forth in 75-1-103, for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy and make recommendations to the governor and the legislature with respect thereto;

(3) develop and recommend to the governor and the legislature state policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the state;

(4) conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;

(5) document and define changes in the natural environment, including the plant and animal systems, and accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;

(6) make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the legislature requests;

(7) analyze legislative proposals in clearly environmental areas and in other fields where legislation might have environmental consequences and assist in preparation of reports for use by legislative committees, administrative agencies, and the public;

(8) consult with and assist legislators who are preparing environmental legislation to clarify any deficiencies or potential conflicts with an overall ecologic plan;

(9) review and evaluate operating programs in the environmental field in the several agencies to identify actual or potential conflicts, both among such

activities and with a general ecologic perspective, and suggest legislation to remedy such situations;

(10) annually, beginning July 1, 1972, transmit to the governor and the legislature and make available to the general public an environmental quality report concerning the state of the environment, which shall contain:

(a) the status and condition of the major natural, manmade, or altered environmental classes of the state, including but not limited to the air, the aquatic (including surface water and groundwater) and the terrestrial environments, including but not limited to the forest, dryland, wetland, range, urban, suburban, and rural environments;

(b) the adequacy of available natural resources for fulfilling human and economic requirements of the state in the light of expected population pressures;

(c) current and foreseeable trends in the quality, management, and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the state in the light of expected population pressures;

(d) a review of the programs and activities (including regulatory activities) of the state and local governments and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development, and utilization of natural resources; and

(e) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

History: En. Sec. 14, Ch. 238, L. 1971; R.C.M. 1947, 69-6514.

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